

# Amateur Radio

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Number 12  
December 2010  
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*Celebrating the centenary of organised amateur radio in Australia*

**Inside:**

**Metalwork at home**

**Build a 150 watt dummy load**

**Home brewing without headaches**

**Contests:  
RD results  
and rules for  
summer VHF  
contests**

**Predict your antenna performance:  
model it prior to construction**

*Join us at  
the AGM  
in Darwin  
in May  
2011*

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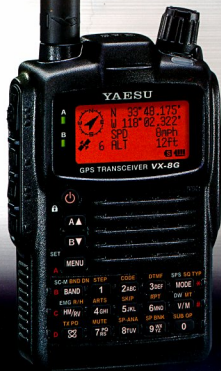
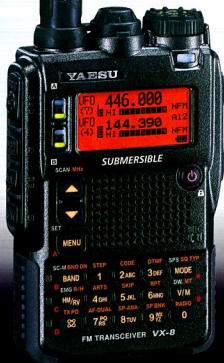


*Season's Greetings*



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# Amateur Radio

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## GENERAL

<b>WIA ANNUAL CONFERENCE</b>	<b>3</b>
<b>Election of Directors — Call for Nominations</b>	<b>15</b>
<b>WICEN bridges the gap</b> <i>Roger Nichols VK7ARN</i>	<b>31</b>
<b>WIA President visits Rockhampton</b> <i>Les Unwin VK4VIL</i>	<b>32</b>
<b>Gridsquare Standings at 15 October 2010</b>	<b>36</b>
<b>VK9NA 2011 Get your gear ready for mid January</b> <i>The VK9NA team</i>	<b>59</b>

## TECHNICAL

<b>A matching system for two 23 cm antennas</b> <i>Peter Cossins VK3BFC</i>	<b>6</b>
<b>Building a 50 ohm 150 watt RF dummy load</b> <i>Roderick Wall VK3YC</i>	<b>8</b>
<b>A simple wire separating technique for coaxial cable</b> <i>Dr Hank Prunckun VK5JAZ</i>	<b>16</b>
<b>The best band for optical DX</b> <i>Paul Edwards VK7ZAS</i>	<b>18</b>
<b>Homebrewing without the headache?</b> <i>Geoff Emery VK4ZPP and Ross Pittard VK3CE</i>	<b>22</b>
<b>Metal work at home</b> <i>Jim Tregellas VK5JST</i>	<b>25</b>

## COLUMNS

ALARA.....	50	WIA Comment.....	5
AMSAT.....	60	WIA News.....	4
Contests.....	42	News from:	
DX - News & Views.....	40	VK2.....	31, 35
Editorial.....	2	VK3.....	30, 34
Hamads.....	64	VK4.....	59
Silent Key.....	38, 53	VK5 (AHARS).....	39
Spotlight On SWLING.....	21	VK6.....	49
VHF/UHF - An Expanding World.....	54	VK7.....	52

## Our Cover:

Are you planning to attend the WIA 2011 AGM in May?  
If so, you will have time to explore Wangi Falls in the  
Litchfield National Park during the tour on Sunday.  
*Photo courtesy of Tourism NT.*



### Contributions to Amateur Radio

Amateur Radio is a forum for WIA members' amateur radio experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are welcome and will be considered for publication. Articles attached to email are especially welcome. The WIA cannot be responsible for loss or damage to any material. Information on house style is available from the Editor.

### Back Issues

Back issues are available directly from the WIA National

Office (until stocks are exhausted), at \$8.00 each (including postage within Australia) to members.

### Photostat copies

If back issues are unavailable, photocopies of articles are available to members at \$2.50 each (plus an additional \$2 for each additional issue in which the article appears).

### Disclaimer

The opinions expressed in this publication do not necessarily reflect the official view of the WIA and the WIA cannot be held responsible for incorrect information published.

## Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs; that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

## Wireless Institute of Australia

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Representing

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# Editorial

Peter Freeman VK3PF

## Season's greetings

Another year is drawing to a close. Officially, the end of December marks the end of the WIA Centenary year. We plan to publish a summary of all the activities early next year. I am sure that we will continue to have more articles submitted of a historical nature.

With the needed emphasis on history this year, together with the large number of contributions on that theme, we now have a large backlog of articles to publish. We will be doing our best to reduce the delays in the future between the acceptance of an article and its appearance inside the magazine. I thank authors for their patience to date.

I am looking forward to a couple of weeks leave, during which I intend to work on many of my long list of radio projects. Number one task will be to get the tower and antennas back up. I trust that all have a happy and safe festive season. Perhaps we may meet on-air in the New Year...

## End of an era

This issue will mark the end of a long association between the WIA and Newsletters Unlimited (NU) – our publishing house since the start of 1999.

In reality, NU is a husband and wife team: John and Gillian (Gill) Nieman. Over the past 16 months or so, most of the work has been undertaken by John. Until then Gill was the key person responsible for the assembly of the majority of the magazine until John took over when Gill decided that it was time to embark upon postgraduate studies.

When I started in the role of Editor five years ago, both John and Gill were very welcoming and helped guide me into a production system with which we could all work. Along the

way, we have made many changes which have resulted in, I believe, a more attractive finished product.

Perhaps the most significant of these changes came early this year. On the WIA side, we imposed a new design concept from an independent designer. Together, NU and the Publications Committee sorted out the wrinkles over the first couple of issues with the new design. At about the same time, NU proposed a new printer, together with a different paper. The net result is the magazine you are now reading.

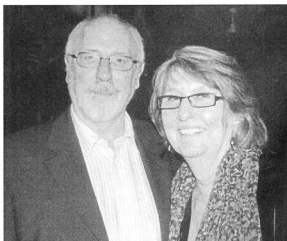
Like many relationships, we have had some bumps along the way. However, goodwill has prevailed on both sides so that we have improved our magazine while containing our budget.

The WIA has decided, partly following a pre-retirement indication from NU, that it was time to move to a new production house. I will advise readers of the details in the first issue of 2011.

As a result, NU and WIA are working on the production of this issue and on a smooth handover to the new contractor during a busy period. John and Gill, thank you very much for all your work, guidance and goodwill.

## Cheers,

Peter VK3PF



The staff at Newsletters Unlimited, John and Gill Nieman



# WIA ANNUAL CONFERENCE

**Darwin, 27, 28 and 29 May 2011**

These are the preliminary details of the WIA 2011 Annual Conference, incorporating the Annual General Meeting and Open Forum. They are published now, so that everyone wanting to participate has plenty of time to make their arrangements. The host club is the Darwin Amateur Radio Club, led by Spud Murphy VK8ZWM.

## Venue

Travelodge Mirambeenaa Resort  
Darwin, 64 Cavenagh Street, Darwin.

## Accommodation

There are many attractive hotels in Darwin. The WIA has special deals with the Travelodge Mirambeenaa.

A standard guest room, with 2 queen beds, for two people, including two buffet breakfasts at \$160 per night.

Executive Room, with a king bed or two singles, for two people, including two buffet breakfasts, \$180 per night.

Townhouse, self contained, with kitchen and extra beds, for two people, including two buffet breakfasts at \$190 per night.

Travelodge will only hold these 'WIA' rooms until 30 April 2011, so early reservation is important. Additional days before and/or after the Conference may be booked at the same rates, so long as they are consecutive.

Call Travelodge Mirambeenaa on 08 8946 0111 and speak to Aleishia Good or Belinda Anthony, quoting the WIA Conference.

## Conference Registration

From 1 December 2010, register on-line on the WIA website, or phone the WIA office. Registration for the weekend will be \$75. That fee will include morning tea, lunch and afternoon tea on Saturday, transport for Friday evening and, for partners not participating in the AGM/Open Forum/Symposium, a tour of Darwin.

## Other costs are:

Darwin Sunset Dinner at Darwin Trailer Boat Club Friday \$55  
Annual Dinner, Saturday night \$50  
Litchfield National Park tour and BBQ, Sunday \$55  
Mindil Beach Sunset Market, Sunday evening \$8  
(You can buy food at the Markets)

Registrants will immediately receive the *Essential Top End Holiday Guide*, to assist planning and will receive the Open Forum documents prior to leaving for Darwin.

## Program

### Friday 27 May 2011

2 pm to 5 pm	Registration at Travelodge Mirambeenaa.
6 pm	Darwin sunset over Fannie Bay at Darwin Trailer Boat Club, with a buffet dinner.

### Saturday 28 May 2011

8 am to 9 am	Registration at Travelodge Mirambeenaa, with welcome tea or coffee
9 am to 12.45 pm	Annual General Meeting and Open Forum, Mirambeenaa Room
1 pm to 1.45 pm	Lunch Treetops Restaurant
2 pm to 5 pm	Symposium - Technology for the Bush, including the Centre for Appropriate Technology
6 pm to 7 pm	Drinks
7 pm	Annual Dinner, Treetops Restaurant

A Partners Tour will be available for Saturday, including visits to some of the highlights of Darwin. The cost of that tour will be included in the registration fee.

### Sunday 29 May 2011

8.30 am to 4.30 pm	Tour to Litchfield National Park, including the termite mounds, Buley rockhole, Florence Falls, with a BBQ lunch and time at Wangi Falls.
6 pm	Host Club event: Mindil Beach Sunset Markets, for a memorable sunset dinner in a special area.

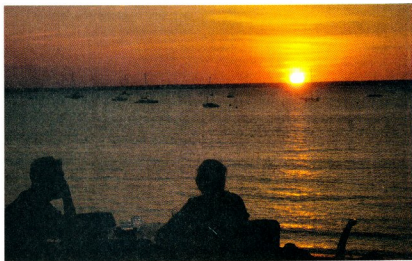
## Transport to Darwin

Depending where you come from, JetStar may be a good bet but check your choice of airline and make your booking early.

## Further Information

The WIA website will publish further information.

The WIA Directors hope that you will join us for this Annual Conference. In doing so you will not only be supporting the WIA but also amateur radio in one of our more remote cities and have a memorable weekend hosted by one of Australia's great radio clubs, famous Asia-wide for its hospitality. **ar**



Fannie Bay sunset from Darwin Trailer Boat Club. Photo: Michael Owen VK3KI.

## New Procedure for Two-Letter Callsign Recommendations

On 1 December 2010, when new fees for Callsign Recommendations start, a new procedure will be adopted for Callsign Recommendations for two letter callsigns in Queensland, New South Wales and Victoria.

Previously, applications could only be made by mail and were processed in the order in which they were received at the WIA office.

It was pointed out that this favoured those living where Express Post operated, and meant that those in remote areas had no chance of obtaining a two letter callsign if anyone in the capital cities wanted the callsign.

The WIA and the ACMA have now agreed on a new procedure that puts everyone on an equal footing.

No callsign recommendation can be made until seven days after a callsign is placed on the Public List (the list of available callsigns on the WIA website), to allow someone who has inadvertently allowed a licence to lapse to claim back the callsign.

Applications for a two letter callsign in Queensland, New South Wales and Victoria will continue to be required to be lodged by mail.

Each application for a particular two letter callsign received in the seven days will be given a number, and after the seven days, if the callsign has not been claimed back and there is more than one person seeking it, cards bearing numbers corresponding to the numbers given to the applications will be 'placed in a hat' and one will be drawn, in the presence of a WIA Director, Secretary or Treasurer.

As at present, if an applicant is unsuccessful and cannot be recommended an acceptable callsign, the fee shall be refunded.

## Important ITU Meetings in Geneva

Monday 8 November 2010 saw the start of the meeting of the ITU Radiocommunications sector (ITU-R) Working Party 5A. WP5A is the group within the ITU structure that deals with technical matters that affect the amateur service as a part of its

broader mandate to study mobile service communications techniques. The meeting ran until Wednesday 17 November.

Representing the WIA was Dale Hughes VK1DSH as a member of the Australian delegation to the meeting. The WP5A meeting is a part of the ITU preparations for WRC-12 which also includes the Conference Preparatory Meeting (CPM) which is to hold its second, and final, meeting in February 2011. The CPM establishes the technical bases for WRC-12 and identifies the possible solutions to each of the WRC-12 agenda items.

Of particular interest to the amateur service is agenda item 1-23, which seeks an amateur allocation in the MF band somewhere between 415 and 526.5 kHz. This meeting of WP5A is particularly important because it is the final opportunity to influence the content of the CPM Report which strongly guides the deliberations at the WRC itself.

Dale presented an outline of the studies currently being undertaken in Australia under authority of the scientific licences issued to the WIA for transmissions in the 505 - 515 kHz band. This information will be added to the body of data that demonstrates that amateur operation in the MF band is capable of providing useful outcomes and can be undertaken without adverse impact on other users of the MF spectrum.

## Meeting of clubs in Adelaide

WIA President Michael Owen VK3KI, Secretary Geoff Atkinson VK3AFA and Director Chris Platt VK3CP and members of the South Australian Advisory Committee attended a meeting of South Australian clubs at the Scout Radio Activities Group HQ in Glenelg on 6 November 2010.

Some 11 clubs were represented at the meeting chaired by David Box VK3DB.

The WIA President gave a general report on the WIA, stressing the success of the Centenary year, and raising a number of issues for discussion. Then each club reported in turn on its activities and general

discussion followed. Among the matters raised was the very recent first National Field Day.

## Final QSO of VK100WIA is with ARRL President

The WIA marked the conclusion of their VK100WIA centennial special event operation on October 31 with a QSO between WIA President Michael Owen VK3KI and ARRL President Kay Craigie N3KN. Logged at 1255 UTC, five minutes before midnight in Australia, the QSO between N3KN and VK100WIA, with VK3KI at the microphone, was the last contact recorded in the Australian special event's log.

The contact was made using EchoLink, with VK100WIA using the VK3ANT node in Melbourne, Victoria. Kay used the K4IJ 440 MHz repeater in Roanoke, Virginia to access the EchoLink node of the linked North Carolina Hospital Emergency Amateur Radio System repeaters (NCHEARS); the NCHEARS system was also linked to the South Carolina Healthcare Emergency Amateur Radio Team (SCHEART) repeaters. Repeater users across three states were able to hear the historic conversation between two continents.

More than 50 WIA-affiliated clubs have used the VK100WIA call sign for almost six months as part of WIA's Centenary celebration. Since VK100WIA went on the air in May, 24,440 contacts have been logged.

Michael told Kay that the WIA was "passing the baton on to the ARRL, as the ARRL would be celebrating its centenary in four years."

## Meeting of Queensland clubs in Rockhampton

WIA President Michael Owen VK3KI and WIA Director Ewan McLeod VK3ERM attended the Annual WIA National President's lunch in Rockhampton on 14 November 2010, the first time the lunch has been held outside Brisbane.

A significant number of clubs were represented, and a very constructive discussion followed a presentation of current matters by the President. **ar**

# 2010 – A Year to Remember

# WIA comment

As the WIA's Centenary year draws to an end, may I look back?

May I suggest that this has been a great year for amateur radio and the WIA? And in ways that are much more than just a successful celebration.

The Centenary Convention weekend at Canberra on 28 to 30 May was an undisputed success. Our special guests from home and overseas added to the excitement of the occasion. The ARISS contact was a highlight of the dinner on Saturday night. The historical presentations Saturday afternoon captured everyone's interest.

And Sunday, thanks to our Centenary patron Dick Smith VK2DIK, a day that we all will remember.

And then there has been VK100WIA. Involving over 50 clubs, Heaven knows how many operators and, after 5 ½ months, 24,440 contacts and over 400 Centenary Awards.

The special callsign has not only drawn attention around the world to our Centenary, it has brought together many people to take advantage of the VK100WIA callsign in many different ways, with some groups focussing on working DX, others using it as a tool to promote amateur radio.

The historical articles in this magazine have made us all very conscious of how much the technology of wireless has developed in 100 years.

All of this has been built around some memorable imagery. The Centenary poster featuring that wonderfully evocative photograph from the Waverley Amateur Radio Society has been, for me, the image of the Centenary.

Many clubs have marked the year in many different ways. To mention only three, the Ipswich & District Radio Club issued a special medal, a number of clubs in the Perth area combined to create the "Super Springtime" event, bringing together the VK100WIA callsign and displays at the Perth Royal Show and at Wireless Hill and the Rockhampton and District Amateur Club had a birthday

cake for the WIA at the Queensland meeting of clubs.

But I think the real significance of this year has been much more than these events and images.

Throughout the year I have been urging anyone who will listen to me to promote amateur radio in their community. The WIA provided its affiliated clubs with a totally professional Media Kit.

The result has been that we have undoubtedly received more favourable publicity in print, radio and TV in one year in more places than ever before.

And the "more places" is significant. The many local and regional media amateur radio stories have been another success of the year. And that is because the clubs have been successful in communicating their story and the story of amateur radio to their local media, very often with the help of the Media Kit.

But in doing all of this we have also established the foundation for a continuing promotional program for next year with the National Field Day. The first National Field Day this year was extremely encouraging and a learning exercise for all involved; and we now have the opportunity to consider if we can do anything even better next year. Some very constructive suggestions have been made, including ideas to meet the challenge of diabolic propagation conditions by relying on IRLP or similar modes, a suggestion that may also meet the problem of antenna location restricting the choice of site.

I believe that we all need to continue to promote amateur radio, our clubs and the WIA. The more the community understands what amateur radio is, or indeed the value of amateur radio to the community, the more likely it is that what we do and wish to do will be accepted.

Of course, we also want to attract new radio amateurs.

But I believe that the year has been successful in an even more significant way.

It has been a very friendly and constructive year. It has been a year

when many of us felt proud to be a radio amateur and proud of the WIA. It has been a year that has rekindled an interest in amateur radio for a number of people.

I have felt a new pride and a new interest, and a new enthusiasm from many people.

And it has been a year when so many people have contributed.

Let me acknowledge a few.

I thank the Centenary Committee and in particular Peter Wolfenden for the historical research and the articles and presentations, Jim Linton for the Media Kit and the articles, Robert Broomhead for organising the Canberra weekend, the promotional material and merchandise and all the work associated with the website, Martin Luther for helping set up the Centenary Award rules, Geoff Atkinson for looking after the VK100WIA QSLs and the Centenary Award, Ted Thrift for ensuring that the clubs took full advantage of the special callsign, all the WIA directors, the WIA Secretary and Treasurer for their support and work and our patron Dick Smith for his support.

I also thank Graham Kemp, Peter Freeman and the Publications Committee for their extra efforts to enable the effective use of the WIA's broadcast and magazine to record and announce much of the Centenary Year activity.

But above all, let us acknowledge the many people from the clubs around Australia who established and operated VK100WIA, who set up the events and activities that we enjoyed and that also promoted amateur radio and who attracted the publicity that is so valuable.

In the end, it is everyone, and there were so many, who contributed and who made 2010 a year to remember.



Michael Owen  
VK3KI

# A matching system for two 23 cm antennas

Peter Cossins VK3BFG

This technique was derived for matching two 23 cm co-linear arrays for the Melbourne Digital Television Repeater, VK3RTV. The repeater inputs are 1250 MHz, 1255 MHz and 1278 MHz and the antenna can be pressed into service on any of those frequencies. The co-linear arrays are broadband in their nature and will accommodate the frequency range.

The matching system, using quarter wave matching lines, is not unusual in its concept. The mechanical construction however, using home made coax, allows control of dimensions that are accurate and appropriate for 23 cm work. The equation below forms the basis of the theory.

$$Z_0 = \sqrt{Z_s \times Z_L}$$

$Z_0$  is the characteristic impedance of the quarter wave matching line,  $Z_s$  the sending end (antenna) impedance and  $Z_L$  the load impedance.

If  $Z_s$  is a 50 ohm antenna and  $Z_L$  is 100 ohms, then  $Z_0$  is 70.7 ohms.

Joining the two 50 ohm antennas together with their quarter wave matching lines gives two 100 ohm loads in parallel making 50 ohms, a match to the line impedance.

This simple network is often called a 'Phasing Harness'. (Odd multiples of one quarter wave can be used as well.) The theory is all well known and used, but the problem at 23 cm is that the dimensions are somewhat critical.

The length of cable required can be calculated as follows:

$$\text{Cable Length (mm)} = \frac{\text{Velocity Factor} \times 3 \times 10^5}{4 \times \text{Frequency (MHz)}}$$

The matching system uses standard stock brass tube available from most hobby shops. The diameter I used was 5.5 mm, but it was selected to just fit the inner of 5C-2V, 75 ohm solid dielectric coaxial cable. The inner was obtained by cutting a piece of the cable and removing the outer cover and shield, leaving the insulation and the inner cable intact.

The dimensions given in this article are for solid dielectric versions of the cable. If foam dielectric cable is used then the quarter wave lines will be a bit longer to allow for the higher velocity factor. Solid dielectric cable is preferred for this application as it is more robust. Velocity factors for various cable types are usually stated in manufacturer's data sheets.

Any suitable 75 ohm cable can be used, with the cable and the brass tube length cut according to

the equation above. The main criteria are that the brass tube and the coaxial cable inner form a snug fit.

The brass tube can be accurately cut and filed to the required length. Using 75 ohm cable (rather than the 70.7 ohm from the formula above) will provide a satisfactory result as final testing proved.

Referring to the photograph, the components required are a silver plated N Connector with Teflon insulation, brass tube to fit the inner of the 75 ohm cable used, double sided PCB, and a 60 by 100 mm approx diecast box. It is advisable to use stainless steel nuts and bolts for durability. The extra cost is absolutely minimal.

Be wary of cheap alternate N Connectors as the insulation in some of these is a form of plastic and will not stand the heat required.

The construction process is as follows:

1. Cut the centre solder terminal of the N connector down to a maximum of 2 mm in length.
2. Using a mini blow torch, pre-solder the N connector near where the brass tube is to be fixed.
3. Tin the ends of two lengths of 41 mm brass tube. Do not use excessive solder.
4. Join the two brass tubes at one end at an angle of approximately 30° using a metal plate to keep the tubes aligned.

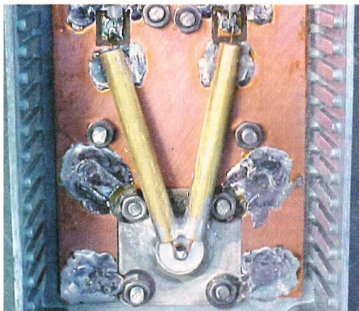


Photo 1 The completed 23 cm matching system.

- Jig/lightly clamp the two brass tubes on the pre-soldered N Connector so that they are aligned as they will be in the final assembly. I attached the N Connector to a piece of scrap flat aluminium plate to simulate the PCB ground plane. It is very important to keep all lead lengths to a minimum.
- Use small gas torch to fill in solder around the N connector and the brass tube.
- Strip back the inner of the cable to be used and accurately cut two lengths using the brass tubes as a guide. Leave a small length of inner at each end. Put them aside for later use.
- Pre-drill the diecast box for the N connector and the PCB groundplane. The N connector should be at one end of the diecast box facing outwards from the bottom. Refer to Photo 1.
- Recess a piece of double sided PCB so that it fits snugly around the N connector as in the photograph.
- Pre-drill the PCB and the diecast box for the stainless steel mounting bolts.
- Pre-drill the diecast box on its bottom edge for the two coaxial cable entries and also two moisture holes. The cable entry holes will need to align with the ends of the brass tube.
- Using the N connector and the soldered brass tubes as a guide, mark exactly where two lands (insulated connection points) should be etched or cut out. These should be just large enough to terminate the phasing harness cables and the cables from the antenna.
- Etch or cut out the termination lands on the PCB.
- Assemble the network using solder lugs to bind the N connector to the PCB and solder the end of the brass tubes to the PCB groundplane (Refer to photograph).
- Insert the 5C-2V inners and terminate on the N connector and also to the two PCB lands.

- The two 23 cm antennas should be fed with equal lengths of 50 ohm cable, fed through the bottom holes of the diecast box and terminated on the PCB lands.
- Alternatively, two additional N connectors can be assembled to the diecast box and connected either directly to the ends of the brass sections or by short lengths of 50 ohm Teflon coaxial cable.
- Remember to keep leads as short as practically possible with all 23 cm wiring connections. For example, if using the additional N connectors, the flanges should be pre-soldered and the Teflon coaxial cable outer soldered directly to the flange. A minimal length of inner then makes the connection to the cut down centre pin of the N connector.

Practical testing of the arrangement using a signal generator, directional coupler and spectrum analyzer with the two brass tube coaxial cable ends terminated using two 100 ohm SMD resistors in parallel on each resulted in a Return Loss of 32 dB.

Return Loss is a term commonly used in industry to describe a RF match. A Return Loss of 32 dB means that the reverse or reflected power is 32dB lower than the forward power. As most amateurs are unable to measure Return Loss, VSWR measurements are often used. A Return Loss of 32 dB represents a VSWR of 1.05:1.

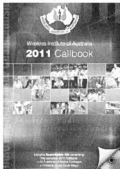
If you have access to coaxial hardline at the required impedance then this can be used with the length adjusted for the velocity factor of the cable.

I have built two of these units with almost identical results. **ar**

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# Building a 50 ohm 150 watt RF dummy load

Roderick Wall VK3YC

Do you use a dummy load when testing your transmitters. Not only is it a good idea, it's a requirement of your licence to use one. Plus you don't want to cause interference on our bands. Here's a design that has good VSWR up to 500 MHz. It uses a Bourns™ 150 watt 50 ohm terminator chip, only 6 mm x 9 mm x 1 mm thick.

## The need for a dummy load

I have a Yaesu FT-301 transceiver that I've owned since new. This transceiver, when introduced in 1976, was said to be the first solid state ham rig with a 100 watt output. My FT-301, after being in storage for many years, was put back into service with a SG-237 Smartuner and long wire. It has now been in use for around two years.

As the transceiver is now 33 years old, I decided that I should check the alignment to ensure that it was putting out a clean powerful signal.

First step was to download the user manual from the internet and print it. I decided to start with the carrier frequency adjustments. On reading the manual it says to inject a 1 kHz audio signal and to adjust the RF output to 50 watts. Then to inject a 300 Hz audio signal (same amplitude) and adjust the carrier frequencies for 12.5 watts output on each sideband.

The manual did not say to adjust the carrier frequencies to 8.9985 MHz for USB and 9.0015 MHz for LSB. This puzzled me so I placed the SSB filter onto the N2PK VNA (vector network analyser) and did an insertion loss trace to determine the filter's band pass shape.

My VNA software that drives the N2PK VNA has a matching tool that allows you to measure the filter at 50 ohm impedance, then to display the trace as if the filter was matched with 500 ohms.

Figure 1 shows that the centre frequency is not 9 MHz and that the carrier frequencies need to be set to suit each individual filter. This is why a power meter and not a frequency counter is used to adjust the carrier frequencies.

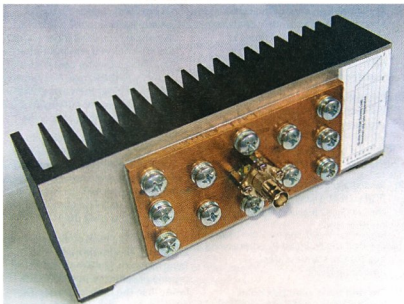


Photo 1: The 50 ohm 150 watt RF dummy load.

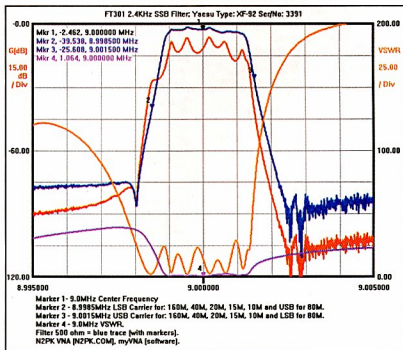


Figure 1: The FT-301 SSB filter trace.

## I don't have a 50 ohm dummy load

Power measurements require a dummy load. Since I didn't have one, a hunt was on to source the parts to build a dummy load.

A search on the Farnell™ website found a Bourns™ 50 ohm 150 watt terminator 6 mm x 9 mm x 1 mm thick at a very reasonable price. Specifications were 150 Watts, DC to 3 GHz VSWR 1.2:1, +/- 5%. According to Bourns derating curve, it's able to dissipate 120% of rated power up to 100 °C, that is,  $150\text{ W} \times 120\% = 180\text{ watts}$ . Farnell at that time were also shipping online orders free, so an order was placed. Refer Photo 2.

## Flange and heat-sink

Now the fun had started. How was I going to dissipate 150 watts through a tiny 54 mm<sup>2</sup> area (6 mm x 9 mm) and into ambient air? Since copper is a much better heat conductor than an aluminium heat sink, then a flange has to be made from copper and have a large surface area, and be as thick as possible.

Peter VK3BPN gave me a piece of copper 120 mm x 60 mm x 6 mm thick. I didn't do any calculations. I decided that I would derate the power handling capability and/or duty cycle depending on the performance of the heat sink. Bourns specification indicates a roll off after 100 °C. I haven't tried it, but it may be possible to use a computer CPU cooler.

The Xigmatek HDT-S1283 CPU cooler has a thermal resistance of 0.16 °C/W. I decided to use a large heat sink, 0.55 °C/W, that I had purchased from Dick Smith™. A piece of copper as large as the heat sink would be better, but could not be found. A possible source of copper plate may be a scrap metal dealer.

While designing the flange, I also considered using water to cool the 50 ohm terminator. A small hose attached to a water tap and to a series of holes drilled into the flange is possible.

## Making the copper flange

Marking the position for the resistor chip! The best position is in the middle of the flange as this is where total thermal resistance will be lowest. The flange also needs to be mounted onto the heat sink where thermal resistance is lowest, for my

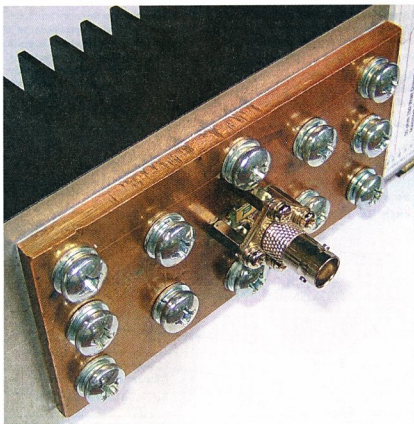


Photo 2: A close up view of the copper flange.

heat sink this is in the middle. Mark the hole positions and drill the holes for the flange/heat sink M6 mounting screws. Tap the holes in the heat sink for M6 screws.

No measurements are given because your flange and heat sink may be different. I used twelve M6 screws to ensure the heat sink compound is as thin as possible to reduce its thermal resistance. You may want to position the holes between the fins of the heat sink. This will then allow you to drill through the heat sink and to use a taper tap. I found that the bottoming (plug) tap I used didn't cut very well in aluminium as it kept clogging up. Hint, use tapping compound or if none to hand, grease or oil at a pinch.

## First try assembling the resistor chip onto the flange

The copper flange was placed onto an electric hotplate and heated to allow the flange surface to be tinned. I then placed the resistor chip onto the flange. While the flange was cooling down, a screwdriver was used to push the chip onto the flange. The solder between the flange and chip should be as thin as possible to reduce thermal resistance.

Four M3 holes were tapped into the flange for standoffs to mount the BNC connector. The next step was to solder the centre pin of the BNC connector onto the top pad of the resistor chip. But this is where I struck a problem. I couldn't get the top pad hot enough because the heat was being conducted through the chip body into the copper flange. That's good because when the chip is dissipating 150 watts you want it to be conducted into the flange and on to the heat-sink. But I needed to first make a connection.

## Change the assembly procedure

There's only one answer to this problem. Due to the resistor chip body being a good thermal conductor, both connections would have to be reflow soldered at the same time. It's not possible to do them one at a time.

If you solder the wire onto the top pad, the heat will run through the chip body into the copper flange. If you solder the chip resistor onto the flange, the top connection will get hot and fall off. The solution is a spring loaded fixture that holds both connections to allow them to

be reflow soldered at the same time. Figure 2 shows a fixture holding the two top wires onto the resistor chip, and the resistor chip onto the flange.

Referring to Figure 3, a 6 mm x 9 mm piece of vero board is used as a clamp to hold the two wires onto

the top pad of the resistor chip. Use a triangle file to file a vee slot into the vero board for the wires. The slot should not be too deep, as the wires must not be loose while being reflow soldered. A spring and slotted cheese head screw holds the parts together while reflow soldering takes place.

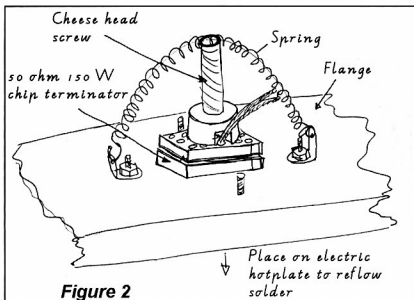


Figure 2: The soldering fixture.

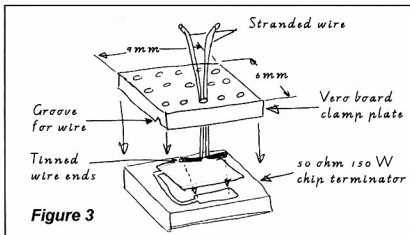


Figure 3: The vero board top clamp.

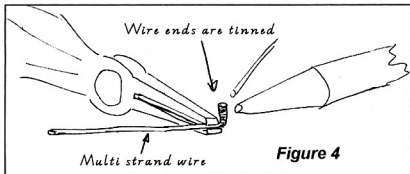


Figure 4: Tinning the wires.

Tightly twist the strands and tin the ends of two wires as in Figure 4. Pliers were used as a heat sink to stop the solder from flowing up the multi strand wire. The multi strand wire between the resistor chip and BNC connector must be free from solder and must be flexible. Warning! If the wire is stiff, it's easy to pull the top pad off the resistor chip. Be careful, the pad appears to be the weakest point on the resistor chip. How do I know, because I now have a resistor chip with a missing top pad!

When the flange has been tinned for the resistor chip, assemble the wires and resistor in the fixture. Place the flange onto an electric hot plate. Heat the flange until the parts are reflow soldered. Wait for the flange to cool and remove the fixture. Be careful when removing the vero board from the wires, you don't want to pull the top pad off. Make sure the wire hole in the vero board is large enough for the wires to easily slide through.

### Connecting the BNC connector

To make room for the wires between the connections, I shortened the insulator and centre pin on the back side of the BNC connector. Then add the standoffs and mount the BNC connector. Solder the two parallel wires onto the centre pin of the connector. Use pliers as a heat sink to stop the solder from flowing down into the multi strand wires. Because there isn't much room under the connector, I used a rubber band on the handles of the pliers to clamp the wires while soldering the connection.

### Final assembly

The base of the copper flange should be flat and free of burrs. Clean the base with Brasso™ before coating it with silicon heat transfer compound. With a spring washer and flat washer on each M6 screw, mount the flange onto the heat sink.

For maximum heat sink efficiency, the heat sink fins should be vertical and clear of the top of the workbench. Attach four stick-on rubber feet to allow this. I also attached a derating curve to remind me to derate the power/duty cycle above 100°C. Copy the label from Figure 5 or download from the WIA website, refer to the URL link listed below. I used clear book covering to protect and hold the label.

Performance

Glenn VK3PE was kind enough to use a HP8753C VNA to measure the return loss, and the results are shown in the graph - refer Figure 6.

Frequency	VSWR	Frequency	VSWR
Below 50 MHz	1.01:1	500 MHz	1.07:1
100 MHz	1.02:1	1 GHz	1.16:1
200 MHz	1.03:1	2 GHz	1.39:1
300 MHz	1.04:1	3 GHz	1.85:1

Bourns specify the resistor chip as 1.2:1 VSWR at 3 GHz. High frequency return loss can be improved if the connector is mounted as shown in Figure 7. Bourns also have a 100 watt version that is specified as 1.1:1 VSWR at 5GHz.

Determining maximum continuous power rating

Maximum continuous power rating depends on: (1) Ambient temperature ( $T_{amb}$ ), (2) Thermal resistance between the resistor chip case and ambient air ( $R_{thCA}$  in  $^{\circ}C/W$ ), (3) Resistor chip maximum temperature ( $T_{Cmax}$ ), (4) and, of course, it can't be above the maximum power rating of the resistor chip. Interesting in that thermal resistance is similar to series connected resistors. Total thermal resistance is the sum of the series connected thermal resistance.  
 $R_{thCA} = R_{thCF} + R_{thFH} + R_{thHA}$   
Also refer to the 'Thermal Resistance' URL links below.

Thermal resistance between the resistor chip case ( $T_c$ ) and ambient temperature ( $T_{amb}$ ) must first be determined. A test was done by dissipating 36 watts in the dummy load and then measuring both  $T_c$  and  $T_{amb}$  when the case temperature has stabilised.

I started at 9 watts and increased the power until the case temperature was  $88^{\circ}C$ ; do not go over  $100^{\circ}C$ . Ideally this test should be as close to  $100^{\circ}C$  as possible and with ambient temperature as high as possible.

My results were:

Power Watts	Ambient Temperature	Resistor case Temperature	Thermal Resistance
9W	$23^{\circ}C$	$35^{\circ}C$	$1.33^{\circ}C/W$
20 ¼ W	$23^{\circ}C$	$52^{\circ}C$	$1.43^{\circ}C/W$
36W	$23^{\circ}C$	$88^{\circ}C$	$1.80^{\circ}C/W$

Using the following formula, thermal resistance is calculated.

$$R_{thCA} (^{\circ}C/W) = \frac{T_c - T_{amb}}{Q} = \frac{88^{\circ}C - 23^{\circ}C}{36W} = 1.8^{\circ}C/W$$

For 36 Watts when ambient temperature is  $23^{\circ}C$ , thermal resistance is:  $1.8^{\circ}C/W$  between resistor chip case and ambient air.

A rough guide can be obtained for other ambient temperatures by using the following formula.

Maximum continuous power dissipation if ambient temperature is  $25^{\circ}C$ :

$$\text{Continuous } Q \text{ (in watts): } Q = \frac{T_c \text{ max} - T_{amb}}{^{\circ}C/W} = \frac{100^{\circ}C - 25^{\circ}C}{1.8^{\circ}C/W} = 41W$$

Continues over page

Derating Curve

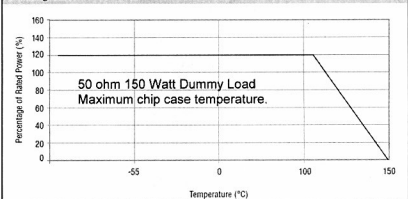


Figure 5: The derating curve label.

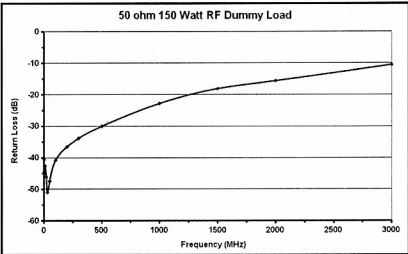


Figure 6: The return loss graph.

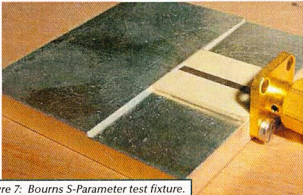


Figure 7: Bourns S-Parameter test fixture.

Note, only use this as a guide.

Because thermal resistance increases between the temperature difference between ambient and resistor chip maximum rating (100° C) gets less. As shown in the above table, thermal resistance also increases with increased power.

I don't have an environment chamber to do tests for different power levels and ambient temperatures. Warning! you need to make sure the resistor chip temperature never exceeds 100° C.

Heat sink efficiency also depends on what the air movement is around the heat sink. Adding a fan will reduce thermal resistance and increase the maximum continuous power dissipation rating.

I did a series of calculations for different ambient temperatures. A text editor was then used to generate a stick-on table that gives a guide for maximum continuous power dissipation for different ambient temperatures. See table below.

Maximum power dissipation can be higher than 41 watts if the ON duty cycle is less than continuous. If the duty

cycle is 50% ON and 50% OFF then power dissipation can be increased to 82 watts. Further, if the duty cycle is 25% ON and 75% OFF, then the full power of 150 W can be dissipated.

Maximum continuous power dissipation is perhaps misleading. Because 150 watts can be dissipated for short ON duty cycles, you only need to ensure the resistor chip case never exceeds 100°C.

I have only ever used my dummy load for low duty test cycles. I found that I can dissipate 100 watts, do any tuning as required, switch off and the heat sink only got warm.

Of course your thermal resistance calculations will be different as your flange/heat sink will not be the same.

### Power measurement

The dummy load has been built, but I need to do power measurements. Since I was only going to use it for HF from 1 MHz to 30 MHz. I used an oscilloscope and calculator to measure the power.

The oscilloscope 10 x probe was connected to the BNC centre pin, not to the pad of the resistor chip as I

didn't want to pull the pad off!

$$P(\text{Watts}) = \frac{V_{\text{peak}}^2}{2R} = \frac{V_{\text{pk.to.pk}}^2}{8R}$$

For power calculations, I use a freeware program called Mini dB-Calculator. It can be downloaded from Softpedia's website. Softpedia's URL is listed below. Mini dB-Calculator is handy as it's also able to do other types of RF calculations.

### References

Derating curve label: <http://www.wia.org.au/members/armag/2010/december>

\*Bourns 50 ohm 150 W resistor chip: Now available from <http://au.mouser.com/>

Thermal resistance: [http://en.wikipedia.org/wiki/Thermal\\_resistance\\_in\\_electronics](http://en.wikipedia.org/wiki/Thermal_resistance_in_electronics)

Thermal calculators: <http://www.novelconceptsinc.com/>  
Mini dB-Calculator: <http://www.softpedia.com/get/Science-CAD/mini-dB-Calculator.shtml>

CPU cooler: <http://www.xigmatek.com>  
N2PK VNA: <http://n2pk.com> **ar**

### Maximum Continuous Power Dissipation

### VK3YC

Watt	55	52	50	47	44	41	38	36	33
Ambient Temperature	0° C	5° C	10° C	15° C	20° C	25° C	30° C	35° C	40° C

### BILL OF MATERIALS

Reference	Part No	Quantity	Purchased from/Comments
R1, 50 Ω 150 W	Bourns CHF3523CNT500LW	1	*Farnell - S/N1435944
Flange	Copper 120 mm x 60 mm x 6 mm	1	Or a size to fit your heat sink
Heat sink	0.55 °C/W 200 mm x 75 mm x 48 mm	1	Dick Smith Cat: H 3406
	Silicon heat transfer compound		Dick Smith Cat: N 1205
	Multi strand copper wire	40 mm	Around 0.5 mm diameter
BNC connector	BNC panel mount connector	1	Or your favourite connector
Connector mount	Metal spacers M3 x 10 mm long	4	
Connector mount	M3 screw 5 mm long	8	Cut the head off four screws
Connector mount	M3 flat washer	4	
Connector mount	M3 spring washer	4	
Flange/Heat sink	M6 screws (length to suite)	12	
Flange/Heat sink	M6 flat washer	12	
Flange/Heat sink	M6 spring washer	12	
	Derating curve label	1	Copy Figure 5, or WIA website
Feet	Self-adhesive rubber feet	4	Dick Smith Cat: H1745
Fixture - soldering			Refer to text





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- ✓ The DX0DX Team Leader Chris Dimitrijevic VK3FY - DU8/VK3FY will give an exclusive insight into the planning, deployment and outcome of this major DXpedition.
- ✓ Optical (light beam) Communications has come a long way through a small number of Australians exploring technology and techniques including over the horizon and cloud bounce. Rex Moncur VK7MO will speak on the subject.
- ✓ The 8th IARU Region 3 Amateur Radio Direction Finding Championships will be held near Bendigo 23-28 September 2011. To tell us all about it and how volunteers can assist will be Jack Bramham VK3WWW the WIAARDF Coordinator.

### DISPLAYS AND ACTIVITIES

- Emergency communications at the ready
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  - Historical radio on show
  - F-Troop photo call of Foundation licensees
  - Bendigo District Astronomical Society
  - CQ Awards QSL checking with VK3PA
- More details listen to the VK1WIA broadcast or check out the website

### Second-hand market and car-boot sales

Bookings of tables and car-boot space close soon. These are low cost and include one entry ticket. An application form and conditions on the website (see below) or contact Tony Hambling VK3VTH 0423 635 152

**Catering:** Hot and cold food and drinks will be catered by the Kyneton CFA Auxiliary. Hot breakfast is available from 9am. Free tea and coffee available all day. Or bring your own lunch to enjoy in picnic style.

**Entry tickets \$10:** On sale from 9am with the gates opening at 10am. Free entry to children aged under 13. No pets or alcohol. The venue is mostly under cover suited for all weather.

**Door prizes:** Entry tickets will be drawn for the winners of available door prizes.

**Venue:** Kyneton Racecourse, Campaspe Place (off Beauchamp St), Kyneton, Only 50 minutes from Melbourne and an hour from Ballarat and Bendigo. Plenty of free parking.

**Info and talk-in:** Mt Macedon 2m repeater VK3RMM 147.250MHz from 7.30am to 10.30am on the day.

**Email:** [radiofest@amateurradio.com.au](mailto:radiofest@amateurradio.com.au)

**Website:** [radiofest.amateurradio.com.au](http://radiofest.amateurradio.com.au)

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# The Wireless Institute of Australia

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## Election of Directors Call for Nominations

Pursuant to clause 14.1 (c) of the Constitution the WIA Board has determined that the election of directors shall be conducted by postal ballot.

Four directors retire at the conclusion of the next Annual General Meeting which will be held at Darwin N.T. on the 28th May 2011, namely Michael John Owen, Peter Richard Young, Ewan Ross McLeod and Philip Rex Adams. Each is eligible for re-election and Michael John Owen, Peter Richard Young, Ewan Ross McLeod and Philip Rex Adams have offered themselves for re-election to four of the four vacancies.

Nominations are called for from others also seeking election as a director of the WIA.

A director must be a voting member of the WIA and must hold an Australian amateur radio licence.

Any person wishing to nominate as a candidate for election as director of the WIA must deliver or cause to be delivered to the Returning Officer by not later than 31 January 2011:

A statement signed by the candidate signifying his or her willingness to be a candidate for election as a director together with;

the full name, age, occupation and callsign of the candidate, and

such other biographical details or other information as the candidate wishes to accompany the ballot papers, but in all not exceeding 250 words.

Delivery to the Returning Officer may be made by hand when the WIA national office is open at:

Unit 20  
11-13 Havelock Road  
Bayswater  
Victoria 3153

or by mail to:  
PO Box 2042  
Bayswater  
Victoria 3153.

Nominations received by facsimile or by electronic means cannot be accepted.

**Chris Chapman VK3QB**  
Returning Officer

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# TET-EMTRON

## News Flash!

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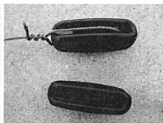
TET-Emtron in conjunction with Tower Communications is having an open day on Sunday, 23<sup>rd</sup> January 2011. On display will be a variety of antennas, home brew parts and HF gear. We will have different radios hooked to different antennas for trial. It is hoped the new ICOM 9100 will be released before hand and be available on the day.

A sausage sizzle and tea and coffee are provided free, and soft drinks are available. Shed is air conditioned.

Doors open at 10.00 am, and close when you all go home. Anybody interested in radio is welcome.



Dipole centres



Insulators



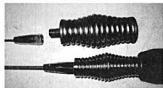
450 Ohm spreaders



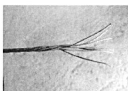
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# A simple wire separating technique for coaxial cable

Dr Hank Prunckun VK5JAZ

## Problem

There are many situations where one needs to connect a length of coaxial cable to a device without the aid of either an SO-238 socket or a PL-259 plug. Wire antennas immediately spring to mind as an example. For instance, half-wave dipoles sometimes require the amateur radio engineer to separate the cable's earth braid from its centre conductor and connect each to the respective wire element of the antenna. Many technical drawings show this procedure, see Figure 1, but it is not easy to achieve this result if one has not had the advantage of seeing it performed.

When one looks at an unterminated end of a 'coax' cable it is not immediately apparent how one goes about doing this – how does one divide two wires when one is inside the other, as seen in Figure 2.

## Context

Coaxial cable consists of a wire conductor at its centre, a circumferential outer conductor (usually braided wire) and an insulator (the dielectric) that separates these two wires. The outer conductor is protected by a weather-proof PVC sheath. This is how the majority of RG-213 and RG-58 cables are constructed. With low-loss cables (such as LMR-400) there is an additional outer shield in the form of metallic foil. This foil is wrapped tightly around the dielectric and the earth braid is snugly draped over it to form a secondary screen. In the main, this is how it achieves its low-loss properties.

## Equipment

Only two pieces of workshop equipment are required to perform this procedure: (1) a set of handheld wire strippers; and (2) a tool with a long shank and slender tip, such as an awl.

## Method

The simplest way to address the problem is to strip the weather-proof PVC insulation and unbraid the earth shield to the point where separation is required (that is, the desired length of wire 'lead'), then twist the braided lead so that it forms a single wire. In order to do this, the braid needs to be unpicked.

Unpicking the braid can be done using a tool with a sharp point (for instance, any instrument for making holes in leather or fabric will do). The braid is unravelled as shown in Figure 3. This is done by unravelling the braid strand-by-strand – first one side, then the opposite, alternating back-and-forth until the desired length is reached as shown in Figure 4.

At this stage it is advisable to strip a few centimetres more than what is required as it is always an option to trim the

excess by cutting – it is much harder to extend the lengths once the procedure has been completed.

The centre conductor is now left exposed and can have its dielectric insulator stripped. If low-loss cable is being used, the foil-screen is removed along with the dielectric. It is a good idea to leave a short length of insulation extending beyond the point where the earth braid has been separated so that it helps prevent inadvertent shorting of the two wires, as shown in Figure 5. Depending on the cable's use, additional insulating and/or weather-proofing precautions can be incorporated into the final configuration.

The final step is to twist the wire braid into a single strand ready for connecting to the intended device. Refer Figure 6.

## Result

There may be other methods of separating the two wires that comprise a coaxial cable but the technique described here is not only simple but effective. The whole procedure can be accomplished in ten minutes or less using only wire strippers and a sharp pointed implement. **ar**

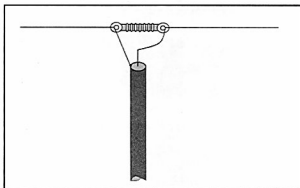


Figure 1.

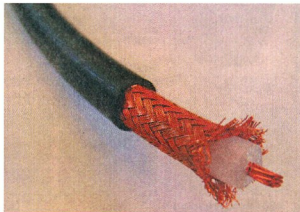


Figure 2.



Figure 3.

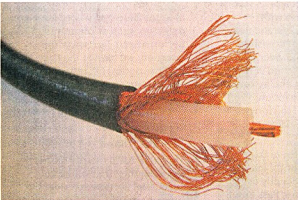


Figure 4.



Figure 5.

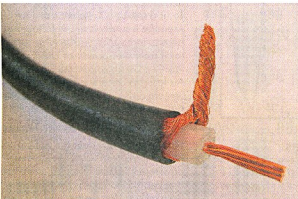


Figure 6.

# ELECTRONICS ONE-STOP-SHOP

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# The best band for optical DX

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Australian amateurs have taken a leading role in innovative lightwave communications, most recently with the successful development of forward scatter over-the-horizon 'cloud bounce' communication over world record distances of hundreds of kilometres. Depending on the availability of suitable hardware, a move from the visible to the near infrared band would provide increased DX capability and aviation-safe operation at visual glare-free wavelengths.

## Introduction

About fifty years ago I wrote an article for AR titled 'The Best Band for VHF' (1). The present article takes another look for the best band from a theoretical standpoint, this time at optical wavelengths. Recent examples of Australian optical DX include the 167 km line-of-sight distance record (2) of 2005, and the 288 km over-the-horizon record crossing of Bass Strait (3, 4) in 2009.

Lightwave communication through the atmosphere is restricted to narrow wavelength 'windows' through which the air is transparent. Figure 1 shows how, apart from the dips in transmittance due to molecular absorption, atmospheric

transparency increases with wavelength in the visible and near infrared (NIR) bands. The visible window, from 0.4 to 0.7 micrometres ( $\mu\text{m}$ ) wavelength, is closed at the shortwave ultraviolet end by ozone absorption. The NIR window, from 0.7 to 1.4  $\mu\text{m}$ , is closed at the longwave infrared end by water vapour absorption.

What is the best choice of laser or led wavelength for optical DX? Is it in the red, 0.63  $\mu\text{m}$ , recently used by a VK7 group to cross Bass Strait in forward scatter mode (3); in the infrared where atmospheric losses are least and where eye-safe (5) and aviation-safe (6) operation is more easily achieved at high power levels,

or at the blue end where large area detectors such as photomultipliers perform best? To answer this question, we look at the basic theory of three optical DX modes available to amateurs, earth-satellite to ground, atmospheric forward scatter 'cloud-bounce' and mountain to mountain line-of-sight.

## The 'Best' band

The 'best' band usually means the wavelength(s) that will enable successful DX contacts over the longest possible distance. It will generally be the band that delivers the highest signal to noise ratio (SNR) at any given distance. In the limit of very weak signals the best band will allow us to exchange the minimum number of bits needed for a QSO in the shortest time with an acceptable error rate. To date, aviation safety regulations and high attenuation, typically more than 140 dB at 300 km for cloud-bounce contacts in red light, have mandated narrow band low bit rate computer-controlled communication protocols such as WSJT and WSC (3, 4). However CW and phone contacts should also be possible at longer wavelengths, as I shall show.

To find the best band we need to examine how each of the following parameters varies with wavelength: (a) Transmitter power or EIRP (= Power x Gain), whichever applies; (b) Air loss; (c) Detector response; (d) System noise (= receiver noise + sky noise + signal noise).

## Eye-safe and aviation-safe beams

Strict regulations limit the optical power density in watts of radiated power per square metre of beam area that can be launched by a lightwave transmitter. These wavelength-dependent limits are set by eye-

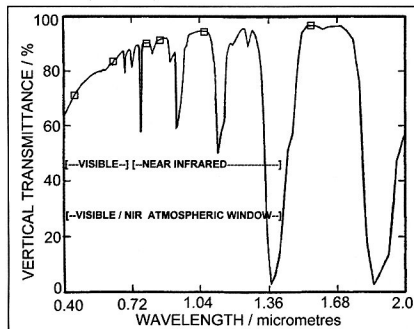


Figure 1: Light transmittance from an overhead satellite through clear air to a receiver at mountain altitude. Notice the increasing transparency at laser/led emission wavelengths of 0.45, 0.63, 0.78, 0.85, 1.06 and 1.55  $\mu\text{m}$  (marked by a  $\square$ ) towards the infrared end of the atmospheric window.

safety standards (5) and by aviation safety regulations (6). For a laser, the 'eye-safe' power density, that is, the maximum permissible exposure (MPE) to which the eye can be safely and continuously exposed, is no more than 10 W/square metre ( $\text{m}^2$ ) within the visible wavelength range, rising to about 15 W/ $\text{m}^2$  at 0.85  $\mu\text{m}$ , 50 W/ $\text{m}^2$  at 1.06  $\mu\text{m}$  and higher values at longer wavelengths. Visible light emitters are subject to additional more stringent national and regional aviation safety regulations covering navigable air space. In a laser-beam sensitive flight zone (LSFZ) (6) in Australia, this limit is only 1 W/square metre for visible light, 10 dB lower than the MPE for visible wavelengths. This tighter limit is designed to protect aircrew against glare and flash-blindness in the vicinity of an airport. At wavelengths longer than about 0.75  $\mu\text{m}$  (750 nm), visual glare is unlikely to be a hazard but eye health and safety limits continue to apply and protective safety glasses should be worn as the 'blink' protection at visible wavelengths is no longer available.

From the numbers above, conservative estimates for safe continuous exposure permit 17 dB more launch power density at 1064 nm than at visible wavelengths in sensitive flight zones (LSFZ), and 7 dB more in normal flight zones where the usual eye safety standards still apply. These limits also apply to transmitter power and EIRP so they will directly affect the SNR budget.

## Air loss

Table 1 shows that this increased transparency, although small for an overhead satellite, translates to a very large reduction in air loss over long horizontal line-of-sight and cloud-bounce paths. The loss rates,

which have been derived from data in reference 7 and other more recent sources, are indicative only because of the wide variability in transparency due to dust and water vapour. The recent VK7 and VK7/VK3 cloud-bounce contacts (3, 4) at 630 nm are consistent with the tabled rate of 0.1 dB/km.

## Detector response

The response of a lightwave detector, measured in microamps of signal current per microwatt of optical power normally increases with wavelength. Unfortunately, the efficiency of lightwave detectors

eventually drops off at longer wavelengths. This is particularly noticeable for photomultiplier tubes which have low efficiencies for red light. Silicon photodiode detectors have much higher efficiency, approaching 100% at peak, but start to fail around 1  $\mu\text{m}$ , even when specially enhanced at the NIR end of the spectrum, as in Figure 2.

The legend on the vertical axis of Figure 2 illustrates an important difference between radio and optical links: the optical signal power converts to an electrical current (or voltage), not to an electrical

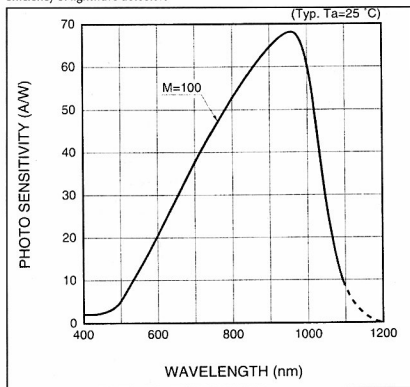


Figure 2. Spectral response (8) of a state-of-the-art NIR-enhanced APD (Hamamatsu S8890 series) showing how signal current varies with wavelength for fixed optical power.

Wavelength/nm	450 (Blue)	630 (Red)	780 (NIR)	850 (NIR)	1064 (NIR)	Calculated for:
Exceptionally clear air loss /dB. <sup>7</sup>	4.7	2.5	1.4	1.1	0.64	Satellite to ground down link, 19.5 deg elevation.
Exceptionally clear air loss rate, dB/km.	0.18	0.10	0.055	0.042	0.025	High altitude cirrus cloud-bounce.
Exceptionally clear air path loss / dB for high cloud-bounce.	72	40	22	17	10	Exceptionally clear air over 400 km cloud bounce path.
Clear air loss rate, dB/km for elevated line of sight.	0.35	0.23	0.18	0.16	0.13	Clear air line-of-sight at mountain altitudes.
Clear air path loss /dB for mountain altitude line-of-sight.	87.5	57.5	45	40	32.5	Clear air mountain altitude 250 km line-of-sight path.

Table 1: Indicative clear air loss rates in optical dB/km and the corresponding path losses, showing the smaller air losses due to increased atmospheric transparency at longer laser/LED wavelengths.

power as you might expect. This is because lightwave detectors, unlike radio antennas, are 'square-law' transducers. In practice this means that every 'optical' dB of gain (or loss) in Table 1 and Figures 1 and 2, results in a change of 2 dB in the electrical signal and therefore also in the SNR for weak signals.

### Signal to Noise Ratio

Noise forms the bottom line of all signal to noise ratio calculations, so if the system noise is band independent then the optimum wavelength will provide the greatest received signal power. This is the basis for using the formula below to calculate the change in SNR with wavelength:

$$\Delta \text{SNR} / \text{dB} = 2 P - 2 L + 2 R$$

This formula applies for a fixed noise level, independent of wavelength, where P = launch power (or EIRP, which ever applies) in dBW, subject to any band dependence imposed by technology and safety regulations, L =

air loss in optical dB and R = detector responsiveness in optical dB.

Optical system noise consists of shot noise from the signal, the sky, and the receiver. We can usually neglect signal noise for weak DX signals, so the total system noise will be fixed if either (a) no selective optical filter is used at the receiver, or (b) the receiver noise swamps the sky noise.

Sky noise varies with wavelength in the same way as the sky brightness but, unlike the daytime sky, the night sky is brightest and noisiest at the infrared end of the spectrum (7).

The effect of night sky noise on the best band is illustrated in Table 2 and Figure 3 for a satellite downlink. Two cases are tabled, one for a fixed noise floor, the other for a noise floor set by filtered sky noise. In this latter case the night sky noise (7) in dB has been subtracted to give the SNR variation with wavelength. Actual noise and SNR values depend on factors such as detector area and field of view, bandwidth, and modulation method.

1550 nm has been excluded from the table as a noisier detector is required at this wavelength.

### Satellite to Ground

Table 2 shows the weak signal SNR variation across the window for fixed EIRP. With no sky filter, or for a system limited by receiver noise, there is a large increase (35 dB) in SNR in moving from the blue to the optimum wavelength (850 nm). When optically filtered night sky noise is subtracted from the electrical signal the NIR band remains optimum although the variation across the window is now much less. Figure 3 shows both these cases.

### Cloud Bounce

The current state of the cloud bounce art achieves a SNR of -30 dB in 2500 Hz bandwidth with an unfiltered silicon APD/FET receiver (3, 4) over a distance of 288 km in red light at 630 nm. No significant wavelength dependence of the cloud scatter gain is expected for high level cirrus cloud although this remains to be explored (9). According to Table 2, eyesafe and LSFZ compliant operation at 1064 nm could raise the SNR by as much as 93 dB over 400 km, providing suitable hardware is available. Table 1 gives an increase of 77 dB at 300 km, resulting in a SNR of +47 dB at 1064 nm, sufficient to give a readable cloud-bounce phone signal over 300 km. For fixed radiated power the SNR increases by about 60 dB at 400 km and more than 40 dB at 300 km, so an alternative (QRP) strategy would be to transmit in the NIR band at reduced power. This could provide unconditionally eye-safe low bit rate signals at a fraction of a watt with a range of 300 km or more.

### Line-of-Sight

Narrow beam line-of-sight (LOS) DX through the lower atmosphere, even at mountain altitudes, is subject to

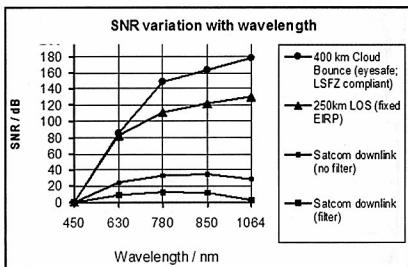


Figure 3: Indicative changes in SNR across the atmospheric window for three optical DX modes at five laser/led wavelengths.

Wavelength/ nm	450 (Blue)	630 (Red)	780 (NIR)	850 (NIR)	1060 (NIR)	Calculated for:
SNR / dB	0	25	33	35	28	Satellite downlink: 19.5deg elevation; no sky filter; fixed EIRP.
SNR / dB,	0	9	13	12	3	Satellite downlink: 19.5 deg elevation; sky filter; fixed EIRP.
SNR / dB	0	85	149	163	178	400 km eyesafe & LSFZ - compliant cloud bounce array; no sky filter.
SNR / dB	0	83	111	122	130	250 km LOS mountain altitude, fixed EIRP; no sky filter.

Table 2: Indicative SNR variation with wavelength for three optical DX modes in clear air. All results have been referenced to blue light by subtracting off the blue (450 nm) SNR values.

highly variable scattering by aerosols and absorption by water vapour. This leads to heavy air losses over a 250 km path with a huge variation in SNR over the window, as for cloud bounce. The large air loss ensures that 1064 nm is again the best wavelength. Optical sky filtering could raise the SNR substantially by lowering the system noise but would not alter this conclusion for either cloud-bounce or line-of-sight DX.

## Conclusions

Table 2 and Figure 3 show the expected variation in SNR over visible and near infrared wavelengths in clear air. Although these figures should be regarded as indicative only, they clearly show how operation in the visible band is handicapped by high air losses.

Recent record-breaking optical DX contacts have used 630 nm (red) light. DX capability can be enhanced and possible visual glare hazards to aviation can be eliminated by moving from the visible band to wavelengths such as 850 nm and 1064 nm in the near infrared band.

However, protective eye-glasses must be worn since 'blink' protection has been lost. Note that the practical implementation of near infrared operation is well outside the scope of this article which is limited to a discussion of the basic theory.

## Acknowledgements

I thank Justin VK7TW and Rex VK7MO for raising the question of the best optical DX band. Thanks also to Adrian VK2ALF, Peter Zelman and Col Cochran for helpful discussions while transmitting single photons across chilly Canberra skies. None of the afore mentioned have any responsibility for the views expressed in this article.

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# Spotlight on SWLING

## My seasonal wish is better propagation

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2010 is rapidly coming to a conclusion. It has been a rather depressing year for me on a personal level and I can hardly wait for 2011.

The exodus of shortwave broadcasters has continued and is likely to escalate further in the New Year. Already we have seen Radio Sweden leave shortwave for good and Radio Slovakia has announced that it is also departing shortwave. Major broadcasters such as Deutsche Welle and the Voice of Russia have also indicated that they see no future in continuing to air programs via shortwave. The audiences have shrunk especially in Europe, North America, Asia and Oceania yet Africa will remain the exception for quite a lengthy period.

As I have repeatedly reported, noticeable gaps are appearing within the allocated broadcasting segments, revealing smaller domestic outlets long submerged under stronger emissions. Yet there are still collisions on channels usually between

broadcasters who abide by the HFCC and those organisations that are outside the frequency coordination scheme. Iran, Cuba, North Korea and Serbia are some of the nations outside of the High Frequency Coordination Council (HFCC).

I do hope that propagation will improve during 2011. This year it has slowly improved yet is still far from even getting to the medium phase of the sunspot cycle. I do expect that the higher frequencies will significantly improve over the next year. The broadcasting allocation on 21 MHz is sparsely populated these days compared to the last peak of the Solar Cycle. However the amateur segment below 21.450 is expected to roar into life over the summer months.

Remember when the BBC World Service used to flatten the needle on 25640? I recollect easily hearing it from 0900. The senders were based at Daventry and were regular over the Spring and Summer. It has been silent

for many decades and the Daventry site was also decommissioned. The only remaining outlet was French and that too was turned off. This led to the 11 metre broadcasting segment being abandoned and I wonder if it will ever be resurrected at the peak of the Cycle.

I noted that another organisation has taken over the former BBC senders. Babcock has purchased VT Thomson and now manages Skelton, Rampisham, Thailand, Ascension Island and a site in the United Arab Emirates. The BBC is only one of the clients using these sites as there are other broadcasters also utilising these senders.

Well that is all for 2010 and I extend to you the best wishes for the Season and hope that 2011 will bring you health, happiness and improved propagation.

73

Robin VK7RH

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# Foundation Corner 14

## Homebrewing without the headache?

Geoff Emery VK4ZPP and Ross Pittard VK3CE

Sometime in our amateur radio journey we will get the temptation to put something together, as in a kit project, build something from scratch from materials gathered for the job or maybe modify some bits and pieces found lurking in the junk box. Ross has covered some of the test equipment and items which are handy and may become indispensable around the amateur shack in Foundation Corner, December 2009.

If you have been reading *Amateur Radio* magazine for a while, you will have met Drew Diamond VK3XU through some of his excellent constructional articles. One thing that you will gain from Drew's writings is good workshop practice. Being able to heat, bend, cut, strip, join and terminate are all words we become familiar with when homebrewing.

Being able to do these things safely and neatly is part of the reason that we start our licensed journey by doing a basic practical assessment. As we move on, as in all areas of skilling, training and practice help us get the tuned eye and the calibrated ear and so on.

One basic skill that is worth getting familiar with is that of soldering. In making copper wire antennas, we solder joints to maintain physical integrity but also to reduce 'electrical' noise. We may need an enclosure, a box, and we have some printed circuit board (PCB); to make the box 'RF' tight we solder the seams and joints (see Foundation Corner 8). We may have scored a treasure from the 'trash and treasure' table and on investigation it is obvious that a wire is floating in air without the support of some nice clean silver metal, a dab of solder can get you a cheap treasure.

Basically, the process of soft soldering is that of heating the surfaces to be joined sufficiently that the solder melts and flows, before cooling, to make a 'clean' joint. For electronics, this means that the resin flux is melted away and the cooled solder has a consistent shine over its visible surface.

The items to be soldered may have to be prepared by abrasion or alcohol wiping. One hobbyist electronics outlet was notorious for supplying plated fittings which defied all attempts at soldering until the surfaces were scraped, cleaned with wet-and-dry, otherwise treated. This was the price of buying hobby components rather than trade quality.

If you are not going to be soldering delicate electronic components, a basic iron will get you started. The important thing is that the tip can transfer adequate heat to the items to be joined

without cooling. Most better-quality irons have various interchangeable tips (Photo 1) – the ones shown have a number on the base indicating working temperature. Tip selection will vary according to the thermal mass of the job. It will take more heat to join a PL 259 to RG-213 than to join the pigtail of a component to a PCB. It will take more heat to solder your antenna wires at the insulators than it will to join strips of PCB material to make a box.

If you can stretch to one, a propane powered soldering iron (Photo 2) does not have any voltage on the tip and is safe to use on sensitive components. It has the other advantage that you can turn the wick up or down depending on how much heat the job requires. They are great for portable/field use.....no long extension cables needed.

Recently there is another alternative in soldering iron selection, the Chinese copies of temperature controlled irons. These can be purchased new at amateur swap meets for a fraction of the cost of the 'real' item. For the occasional user, they are more than adequate (Photo 5).

If you have a mentor or belong to a radio club, try and arrange some training and practice with the soldering iron. If you are teaching yourself, remember that oxides on copper and ferrous metals generally do not permit making good electrical solder joints. I find the cheap snap bladed knife brilliant for these small clean-up jobs. Sandpaper, plastic and metal scouring pads can all be useful for cleaning prior to soldering. Always use electrical/electronic grade solder, that is, 60% tin:40% lead or learn to use the new lead free solder.

Remember, if the solder melts onto the tip of the iron and promptly balls up or worse still runs off like water, there is too much heat in the tip. Always ensure that the tip is

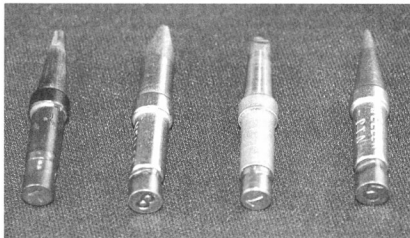


Photo 1: Different tips with numbers on the base indicating temperature.



'tinned' with solder and has no 'gunge' on it. I prefer to use a damp sponge for tip cleaning but others use the metal kitchen scourer as a dry tip cleaner.

Cutting things up is important. I have already mentioned the snap bladed knife. This is a versatile tool which is cheap. With practice you will quickly remove the insulation from cable by rolling the cable over the blade. You do not need to cut as deep as the wire but just obtain a complete circumference cut. Most synthetics or solid sheaths will stretch and break, at the cut, and the waste can be pulled off.

Thin metal, such as beverage container 'tins' can be easily cut with utility scissors bought for a couple of dollars. PCB material can be cut with a hacksaw or a rotary tool (Dremel™), but I find using the correct blade with a good back slope on my variable speed jig-saw is the easiest way to go. Please remember that phenolic and fibre-glass substrates produce dusts which should not be breathed in. Aviation snips are great for other metal cutting and trimming jobs. For those of us old enough to remember, a 'nibbling' tool (Photo 3) is a handy item in the shack as are some hole punches (Photo 4).

Now for some heresy; as a hobbyist I do not have a big budget or a proper workshop. As different jobs may require different tools, we have an option to go and buy one off and delay completing the project or compromise. Many of the basic hand tools that I use are strictly cheap Asian imports designed for the handyman market. Even many of my power tools fall into this category as well. Strictly speaking, files for ferrous metal should not be used on non ferrous materials – but I use what is at hand and they can be cheaply replaced. I may be working plastics, aluminium, copper and stainless steel and one tool can be used for the lot.

Similarly a selection of imported metal working high speed drill bits, HSS, in metric and imperial sizes combined with spur point woodworking bits manage to put neat holes in a variety of materials. This is made easier by using a variable speed drill. For hole cutting, I still have the original imperial sized chassis punches but these are supplemented by a hand nibbler and some rotary hole saws.

The caution in using the cheaper handyman range of tools is that for the price they are sold, they are brilliant and



Photo 2: Propane gas powered soldering iron.



Photo 3: Nibbling tool.



Photo 4: Octal Valve hole punch; who remembers them?

economical. However, greater care is needed as the quality of the steel tends to be lower than brand name trade tools.

Just remember that brand name manufacturers have a range of handyman products identified by price and often colour. Drill bits, files and hacksaw blades are good examples of this. However, used sensibly they are quite safe even though they wear and break more easily.

In the power tool range, the variable speed electric drill, a variable speed jig saw and a rotary tool (Dremel) used with an engineer's vice (metal working) and suitable clamps give the hobbyist panel basher a versatility unheard of in previous years.

The choice of tool and the price range is for the individual. My use is intermittent and light so the cheap imports are fine. The same applies to hand tools with small pliers and cutters being cheap. I have lifetime guaranteed side cutters that are gapped and the previous pair broke a jaw. I have discount store black steel 10 cm (4 inch) cutters that have served me for many years.

In the cheaper tool range, you do some of the quality control. Check for alignment and freedom of movement – hold pliers up to the light to see that the jaws meet properly. Rotate power tools to check for binding and trueness of action.

With drill bits and saw blades you might learn by experience which brands to buy and which to ignore.



Photo 5: Chinese 'Knock-off' temperature controlled iron

I have had drill bits that bent like pretzels and 'hardened' saw blades that shed teeth like confetti. Remember the old warning and shop carefully – caveat emptor.

Generally, a little bit of the 'fix it' gene seems to reside in most radio/electronics enthusiasts and so some of these tools will already be in the collection. The decision and choice of tools will take into account the versatility versus price and will govern how quickly you get the items together.

Experience will tell you when to replace a hand tool with a power tool both for ease of use and also increase the accuracy and speed of doing the job.

The aim is to enjoy this part of the hobby not just blow the cobwebs out of the money belt. For too many men, the hardware shop becomes the toy shop! Get your priorities right – are you a toy collector or a radio amateur? Let the YLs do the shopping if the OM cannot decide!

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# Metal work at home

Jim Tregellas VK5JST

If, like me, you are into electronics and amateur radio seriously, you will regularly find yourself in the position of having to provide an enclosure for your latest project.

Now there are plenty of great enclosures available at the local electronics shop, but guess what? My projects never seem to fit them. The project is either too large (linear amplifiers, antenna tuning units, transceivers, power supplies, etc) or there are just too many knobs and meters to fit into the front panel space available.

Or there is some other subtle factor which makes the selected enclosure unusable, like too expensive, and so I usually end up rolling my own. Here is how I go about it, using a few simple tools.

## Raw materials

Almost any enclosure for large amateur radio equipment can be made from 0.8 – 1 mm thick aluminium sheet. Careful thought must be given to the placement of large heavy items like power transformers. Such items should be placed next to an enclosure wall or near a right angle fold to obtain maximum strength and to avoid flexure. If necessary, this part of the enclosure can be beefed up with a piece of heavier sheet.

New aluminium sections and large sheets can be obtained from suppliers like Capral. Smaller sheets can be had from hardware outlets such as Bunnings, and suppliers of non ferrous metals in your capital city. See the 'Yellow Pages' or check the 'net'. Expect to pay around \$12- \$17 per kilogram. Capral has a complete catalogue of its products on the 'net'.

My favourite source for powder coated sheet is from the washing machine trade-ins at my local branch of the 'Good Guys'. Older large Hoover washing machines have a very big aluminium lid 1.6 mm thick which is excellent for constructing cases for heavy power supplies. So check out your local washing machine reconditioner or supply

house. You will need a Phillips screwdriver to whip out the two stainless screws in the hinges and the lid is yours. The saw described below removes the lid edges and you end up with a very nice piece of powder coated sheet around 400 mm square. Scrap metal yards are also good for

aluminium sections and sheet of all sizes and thicknesses too, and the price is usually right (around \$2 per kilogram).

## Marking Out

The tools for marking out are very basic and should be a part of

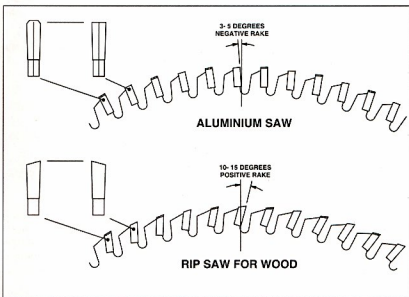


Figure 1: Details of wood and metal cutting circular saw blades.

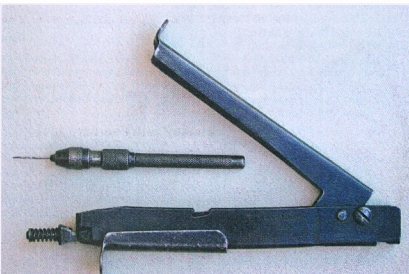


Figure 2: A pin chuck and sheet metal nibbler.

the standard equipment in every workshop. The first essential tool is the simple scribe. The scribe I use is straight. One end is flat so that it can be tapped gently with a light

hammer to also serve as a precision centre punch when marking out hole centres.

The other end is carefully ground

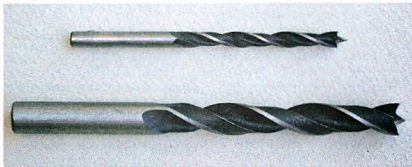


Figure 3: Sheet metal drills.

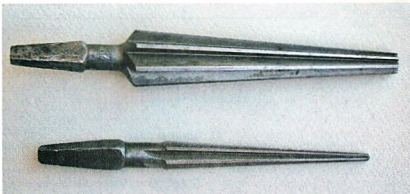


Figure 4: 3-12 mm and 10-25 mm jobbers reamers.

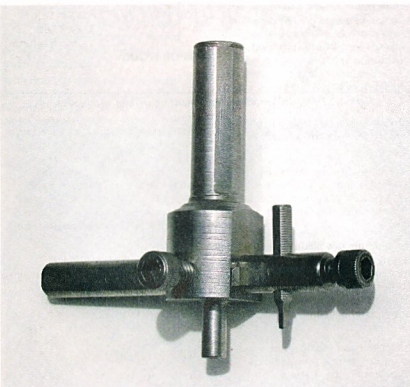


Figure 5: A homemade flycutter.

to a long fine cone shape, with the end millimetre or so being ground to form a sharp 60 degree conical point.

Unlike the centre punches normally on sale for woodworking, a punch of this form can be used to feel for the intersection of two scribed lines on a metal surface and this makes drilling holes in the right place relatively easy.

Next item is the engineering straight edge. This should have a length of at least 500 mm, but preferably 1000 mm, and will find a myriad of other uses around the workshop. Buy the best you can afford in stainless steel. A 300 mm steel rule with a scale having zero mm at the scale centre is a very useful item too, as it allows symmetrical marking out on either side of a centre line. This makes the marking out of panel holes for items such IEC power plugs almost a pleasure.

The third item is the engineering square, which should be checked for squareness directly after purchase and thereafter handled with kid gloves. An ordinary wood worker's square can be used, but for a few extra bucks, a toolmaker's square is a better investment.

Squareness can be checked with two methods. The first is to find a piece of sheet with a truly straight edge. The square is placed on this edge and a line is scribed at right angles to the edge using the square and a scribe. The square is then turned over and the process repeated. If the square is true then the two scribed lines will be parallel.

A second method is to place the square on a mirror (clean float glass is extraordinarily flat) and sight down the edge of the square at right angles to the mirror surface. If the square is true, the edge and its reflection will form a straight line.

I would suggest buying a square with a top edge length of around 250 mm. If you need to mark out a 1000 mm wide sheet, the upper arm of the square can be extended with your straight edge.

The next essential tool is a set of engineering dividers, used for scribing large and small circles on material. Most units on sale will scribe circles up to 200 mm diameter and this is fine for electronic

prototyping. A good quality set will be of rigid construction and have an excellent hinge. The overall utility of this tool can be checked by gently scribing a small diameter circle (say 6 mm diameter) on a piece of sheet. Poor quality will instantly show up, as the legs collapse inwards.

The last essential items for good marking out are a pin chuck and a well sharpened 1 mm diameter drill. Most large drill chucks will not hold small drills, and the pin chuck (Figure 2) overcomes this problem.

A one mm diameter drill fits very nicely into the hole formed by a centre punch, and will centre itself beautifully provided that most of the drill length is out of the chuck allowing it to flex sideways slightly and pick up the exact hole centre. Once you have an accurately centred 1 mm hole in your material, it can be used to precisely centre a larger drill to form a hole of the final desired size in your material. Attempts to centre a large drill on a centre punch mark without a guide hole usually fails dismally.

One millimetre diameter holes are also very useful where cut-outs are required in sheet material. Where a panel has edge flanges, small 90 degree cut-outs are required, and a 1 mm hole in the corner of the cut-out provides a nice stop to the motion of a hacksaw or tin snips. It also reduces stresses during folding, preventing tearing at corners.

## Cutting to Size

There are several ways of reducing large sheets to a final size. The first method is to use a sheet metal guillotine but few people have access to these items.

What I use is an aluminium cutting blade fitted to my table saw. Details of this blade are shown in Figure 1. Such a saw will cut thin aluminium alloy sheet like butter due to its special tooth form. Note that all teeth have a negative rake, and that alternative teeth are either square or coffin shaped.

The coffin shaped tooth removes material from the centre of the cut while the following square tooth removes the remaining material at the two edges of the cut. In this way the load on each tooth is minimised.

Never use a wood saw blade on

a power tool to cut aluminium as the positive rake will cause digging in, which is extremely dangerous. During cutting, an aluminium saw blade should be occasionally lubricated to prevent small particles of aluminium from welding themselves to the leading edge and sides of each tooth. First, this causes rough cutting and, finally, will lead to the saw blade jamming itself in the material being cut.

The saw blade (and you) can be damaged permanently as lost teeth are a possible outcome of a saw jam. There are special lubricants sold in stick form to overcome this problem, but beeswax, or the stick lubricant sold at your local automotive parts outlet to lubricate car door locks, seem to work well.

Some people suggest reversing a conventional wood rip saw (so the teeth face backwards) to cut aluminium. This is a stupid and very dangerous practice for a number of reasons.

First, wood saws have few teeth and take out great bites of material, while metal cutting demands many fine teeth with each tooth removing a small sliver to reduce tooth load and give a good finish. Second, the weld which bonds the tungsten carbide tooth to the metal saw base is under tension, rather than the compression which occurs when the saw is used properly. So the saw is likely to shed teeth.

Further, if you look down at the edge of the saw, the teeth are wedge shaped and the long edge is supposed to face forward to cut clearance for the narrower rear of the tooth.

So a backward facing saw with backward facing wedged teeth is almost guaranteed to jam, shedding teeth and probably injuring the operator.

An aluminium saw blade generally has quite fine teeth. Both my blades have a tooth about every 10 mm of circumference (80 teeth on a 250 mm diameter blade). It is vital that the blade runs straight and true and is well balanced.

It must be mounted on good bearings so there is no side float. This makes the use of a saw with a ball bearing arbor almost mandatory.

Likewise, guides used to feed the material during cutting should be rigid, smooth in operation, and have no float.

The material must be well supported during cutting right up to the edge of the teeth. A lot of saw tables have very wide slots provided for the saw blade and gaps of 6 mm between the saw blade and table are not uncommon. These gaps are just plain dangerous whether you are cutting wood or aluminium. On fine cuts the waste material is likely to disappear into the gap, only to be flung into your face at tremendous speed.

If you have such a table, it is worth covering it with something sacrificial like a 6 mm thick sheet of Masonite and then raising the saw to cut a zero clearance slot in the Masonite.

Finally, the saw motor and electrics must be protected against the ingress of flying aluminium chips. I do not have much of a problem here because my table saw has a fully sealed induction motor, but I have been very careful to ensure that all switches and electrical wiring on the saw are well sealed.

The correct speed for these blades can be calculated from manufacturer's data, which generally recommends surface speeds from 1000- 1500 metres/min (3000- 5000 ft/min) for aluminium alloys. Check the data for your saw blade, but a 250 mm diameter blade will probably run best in the speed range 1300- 2000 rpm.

Last, I would recommend the use of a table saw, as distinct from a radial arm saw. There are a whole bunch of safety issues with the radial arm saw, not the least of which is that it tends to lift material off the table. This is extremely dangerous, particularly with thin materials. Further, if you happen to put any part of your body in the wrong spot, this type of saw will suck it inwards with no place for escape.

All of the above may sound troublesome, but the great advantage of such a saw is that, relative to a guillotine, it is very cheap and much more flexible. You can cut far larger pieces of aluminium than is possible on a typical one metre wide guillotine.

The cuts are dead straight and you can take off fractions of a millimetre

if you want, so the technique is suitable for final sizing as well as rough cutting. Unlike the standard guillotine, you can also cut sheets of considerable thickness with good clean right angle edges, and 6 mm of thickness is not a big ask.

There are other techniques for cutting aluminium sheet, and these include a jig saw with a well lubricated blade and, for sheets less than 0.8 mm thick, a Stanley knife with a well oiled blade, and a good straightedge. In this last technique, the material is scored through at least half of its thickness with the knife, and then snapped off by bending it back and forth along the scored cut.

In both of these cases, the edge of the material will have to be cleaned up, and this is best done with an ordinary metal framed wood plane which is sharp, has had its base well oiled, and is set up for a very fine cut. With a little care, and by using a straight edge for comparison, an edge which is clean and dead straight can be produced very quickly.

Note that ordinary wood tools can

be used on aluminium alloy sheet without any possibility of damage, because the steels used for cutting blades on wood tools are very much harder than aluminium. In fact, if the aluminium is clean, the tool will remain sharp for far longer than it would if used on wood, as many woods actually contain minute particles of sand distributed throughout the timber by the motion of sap from the plant roots.

If you are really desperate, then aluminium can also be cut with a hacksaw. Tin snips should never be used for cuts longer than about 20 mm. Each time a cut is taken over the full length of the blades, the material will vertically distort into a shallow half moon shape which is almost impossible to straighten out.

### Making holes

Holes come in two shapes, circular and awkward, so let's deal with the circular hole first.

In thin sheet of 1 mm thickness or so, circular holes can be broken into three size ranges, which are diameters less than 6 mm, diameters

between 6 and 12 mm, and diameters over 12 mm.

For holes below 6 mm diameter there is no problem, and all that is required to form an accurate hole is to first mark out and drill a 1 mm diameter pilot hole, and then enlarge it to size with the appropriate metal twist drill.

For sizes between 6 and 12 mm diameter, ordinary metal twist drills are readily available, but there is a problem. When drilling thin sheet, what happens is that the drill point breaks through the material thickness before the outside diameter of the drill has been able to contact the surface of the sheet to form a circular indentation to guide the drill through the rest of the cut.

The drill loses guidance and the result is that the two unguided drill flutes generate drill chatter. The typical outcome is a hole which is oversized and five or seven sided instead of circular. There are two solutions to this problem.

The first is to rigidly clamp the sheet being drilled to a waste piece of hard wood so that the wood holds

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the drill centred through the whole cut, and to drill slowly. The second and far more elegant solution is to use a sheet metal drill, of the form shown in Figure 3. Such a drill readily centres itself in the pilot hole previously drilled and cuts through at the maximum diameter first preventing chatter. Yet another method is to drill a small hole and then enlarge it with a jobber's reamer (Figure 4). Whichever method you use, always drill a 1 mm pilot hole first for accuracy

For holes over 12 mm diameter, special tools must be used as normal twist drills are either not available, or, if they are, will require an extension to the house mortgage. If you are into pain and suffering, no special tools are required to make holes of any shape.

An ordinary small diameter twist drill can be used to produce a series of holes which almost touch each other just inside the outline of the hole required. The point where each hole nearly touches the next is then cut through, and everything is then finished off by filing, using either a half round file for circular holes or a flat file for rectangular holes.

There are less painful methods available, however. These include the nibbling tool shown in Figure 4, which is simple to use. A circular hole is first drilled in the sheet to just accommodate the square cutter on the nibbler. Then away you go, covering the floor and your trousers with little bits of aluminium about 1 mm x 6 mm in size which are the result of the nibbling operation.

These are almost guaranteed to end up where they can cause mega damage to any electronics, so be careful. The hole is then finished off as above by filing, and one of the skills you will acquire, apart from an extended command of the English language, is the ability to file a good rectangular hole.

A second tool which is most useful is the fly cutter (Figure 5) which, together with a bench drill, is used for rapidly making large circular holes.

These are singularly dangerous tools which are great for removing fingers or hands and so are not available through the normal electronic supply houses.

They can be easily made if you have access to a lathe, or readily bought from machine tool suppliers. This tool is shown in Figure 2. The sheet in which the hole is required is first placed on top of a scrap piece of three ply, and a guide hole is drilled through both the sheet and its backing. This guide hole must accurately accommodate the central spigot of the fly cutter.

The sheet and its backing are then very firmly clamped to the drill table having first been centred using the tool spigot. The drill is turned on and the rotating cutter is very slowly lowered to create the circular hole of required diameter. The drill shaft speed should be very low (100 rpm or less).

Under no circumstances should the material be hand held on the drill table. Fly cutters have a habit of jamming and when they do unclamped material will be torn from your grip to form a most effective circular saw which will cut through flesh and bone. Jamming can be prevented by lubricating the cut with the same lubricants previously specified for the sawing of aluminium sheet, and by working slowly.

Finally, it is worth describing how burr free holes can be easily produced in thin sheet (1 mm or less) so that cheap heat-sinks can be made for items like power transistors. Any burr is a no-no as it can puncture the mica or silicon rubber insulating spacer used, and drilled holes in softer materials like aluminium will always have a burr. The hole diameter needed for the mounting screws is generally around 3 mm.

In your workshop you probably have a bench (post) drill. In the old days these machines were referred to as a drill press, simply because they can be used for both drilling and pressing operations if they are of sufficiently rugged construction.

It is quite easy to make a simple press tool to punch 3 mm diameter holes in 1 mm sheet. Simply drill a 3 mm diameter hole in a piece of old flat black mild steel sheet or plate (thicker than 1.6 mm).

Remove the drill from the drill chuck and grind the non cutting end of the drill shaft so that it is dead flat and has sharp edges. Place the drill into the chuck backwards, so that

the flat end now faces downwards. Carefully lower the drill and centre the drill shaft within the hole in the mild steel plate. While the plate is so positioned, clamp it to the drill table.

You now have a press tool and can punch burr free holes in thin aluminium sheet - try it - you will be impressed.

If you have a very rugged post drill (say a 75 mm diameter post) and grind the end of the drill to a very shallow V shape instead of flat, this technique will easily punch holes of up to 6 mm diameter in thin sheet. Add three circular pegs to the steel base to locate one corner of the aluminium sheet and you have a super cheap press tool which can be used for low volume mass production.

### **Fabrication of an Enclosure**

With the equipment outlined above, some very nice boxes can be made. All you need is some flat sheet and 90 degree aluminium angle cut to size, plus some countersunk aluminium pop rivets, and you are in business.

If you need an enclosure of great strength for a project such as a really heavy duty power supply, then this is probably the best way to proceed. The circular saw detailed previously will make mincemeat of 3 mm thick sheet, and 3 mm thick 90 degree angle too.

For a standard enclosure using 0.8 mm aluminium, however, it is probably far quicker and simpler to make up a box composed of a matching U shaped lid and bottom. So that the lid can be simply attached to the bottom using metal thread screws, the bottom will have to be fabricated with edge flanges of say 10 mm width.

Unfortunately, there are no simple methods or tools available to allow the accurate making of such a box. In fact, there is only one machine that does it well, and is flexible enough to be able to produce a panel with edge flanges, and that is a 'finger' folder. Please see my article on how to build your own cheaply in *Amateur Radio*, October 2007, or buy a second hand unit.

Good fabricating!!!

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## Calendar, courses, clean-ups, books and being portable

Jim Linton VK3PC

Website: [www.amateurradio.com.au](http://www.amateurradio.com.au)

Email: [arv@amateurradio.com.au](mailto:arv@amateurradio.com.au)

### End of year arrangements

Season's greetings from the Council of Amateur Radio Victoria, Ross Pittard VK3CE, Peter Mill VK3APO, Terry Murphy VK3UP, Barry Robinson VK3PV, Keith Proctor VK3FT, Peter Cossins VK3BFG, Tony Hambling VK3VTH and myself.

We hope to see many of you at the Centre Victoria RadioFest on Sunday 13 February. An advertisement in this edition of Amateur Radio magazine has more details.

The office at 40g Victory Boulevard Ashburton will close for the summer break on Tuesday 14 December at 12.30 pm, and reopen on 15 February 2011.

Thank you to the team of volunteers who have provided administrative and other support in the office throughout the year.

If you are registered and have QSL cards for the VK3 Outwards Bureau please get these to the office immediately.

Urgent mail will be processed during the summer break, which also gives office bearers time to do a stocktake, and to compile the annual report and financial statements for the auditors.

Notice is given that the annual general meeting of the Wireless Institute of Australia Victoria Division (Amateur Radio Victoria) will be held on Tuesday 17 May, 2011 at Ashburton. The annual reports will be made available to members.

Notice of Motions requiring the signatures of three financial members, and nominations for positions on the board of directors (Council) 2011-2014 needing two such signatures, close on, and must be received by the Secretary no later than 22 February.

### Standard licence bridging course

In response to a demand, mostly from those who obtained their Foundation licence through our

training and assessment weekends, a bridging course is being planned for early 2011.

These highly successful training sessions are held on a number of Wednesday evenings plus a revision Saturday. The quality training experience is available to those who have the Foundation licence, and the dedication to bridge the gap in their knowledge to that required under the Standard licence syllabus.

If you are interested in joining the latest Bridging Course, please contact Barry Robinson VK3PV 0428 516 001 or email [vk3pv@amateurradio.com.au](mailto:vk3pv@amateurradio.com.au)

### VK3WI, VK3RAN & VK100GG

It has been good to see under the guidance of our Events Coordinator, Terry Murphy VK3UP, that Amateur Radio Victoria is engaging in portable operation more often. The past 12 months has certainly seen a growth in that activity.

Recently a team of members helped set up and run VK3WI from the Point Gellibrand Coastal Heritage Park at Williamstown for the WIA National Field Day, a public relations event aimed at introducing amateur radio to the public and emergency services.

In the week before that, the special event callsign VK100GG was activated by Terry VK3UP and Michele Grant VK3FEAT during JOTA to celebrate the Centenary of the Girls Guides Association.

Earlier in the year the callsign VK3RAN was put to good use on board the HMAS Castlemaine Museum Ship at Gem Pier Williamstown.

This included the afternoon of ANZAC Day, when the use of Amplitude Modulation is part of a new on-air activity, International Museum Weekend in June and the Victorian Military Vehicle Corps display in August.

### Downsize your collection

Take the opportunity available to sell or otherwise get rid of unwanted or pre-loved equipment at the Centre Victoria RadioFest No. 4 on Sunday 13 February 2011.

How many more years will it just sit there, gathering dust, taking up space? This major event is an excellent chance to clear out the cluttered garage or spare room. For a sales table or car-boot space booking obtain an application from our website, or phone Tony Hambling VK3VTH 0423 635 152.

In recent weeks members have also donated unwanted equipment to the Amateur Radio Victoria office for it to sell at Victoria's biggest amateur radio event in February, thank you.

### The 2011 Callbook

This latest updated edition is now available from Amateur Radio Victoria. It can mail ordered for \$30.50 or bought over the counter at 40G Victory Boulevard Ashburton on Tuesdays between 10.30 am and 2 pm for \$22.

### Foundation Study Guides

A new stock of the study and operational practice guide book for the Foundation licence can be mail order purchased for \$26 – an ideal gift for someone who may be interested in becoming a radio amateur.

### The Log Book

The ever popular and best log book around proudly produced by Amateur Radio Victoria is still only \$10 over the counter + \$2.75 for posting in Australia. Email orders to [arv@amateurradio.com.au](mailto:arv@amateurradio.com.au) or phone 9885 9261 during office hours.



# WICEN bridges the gap

And it will be doing it again on  
6 February 2011

Roger Nichols VK7ARN

Sunday, February 7, 2010 saw the inaugural Hobart 'Run the Bridge' run, with 1400 runners and walkers completing the 10 km course from Bellerive on Hobart's 'Eastern Shore' to Salamanca Place, home of the famous Saturday street market.

The event's communications framework was provided by WICEN Tasmania (South). WICEN has commercial VHF and UHF licensed frequencies, which were used for the event. The event crew carried hired handhelds with headsets on the UHF network, extended by a repeater on Rosny Hill near the eastern

approaches to the Tasman Bridge. WICEN also provided a back up VHF network with WICEN operators stationed at the Start, Finish and two Aid Points along the way.

The event organiser expressed his gratitude for a job very well done.

Whilst undertaking their support for the event, WICEN took every opportunity to publicise amateur radio in the very public place.

## Team effort

MAJOR events like the 2010 Hobart Run the Bridge simply can't be staged without the support of many and a big thank you must go to the Hobart and Clarence city councils, Tasmania Police, DIER, Salamanca Place retailers, Cricket Tasmania, volunteers from the Clarence Football club, WICEN communications, Athletics Tasmania, our valued sponsors and the public for its understanding and patience during the event. It was a resounding success and we look forward to 2011.

Kerry Stubbs

National operations manager, T3 Events

*"Hobart Mercury, 9 February, 2010.*



Stu VK7NXX at the finish line, with the helicopter overhead, both waiting for the first runner home.



The WICEN vehicle at the finish line, with signage promoting amateur radio.

## COM-AN-TENA

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20 m 3 element beam, 4.9 m boom	\$494
2 m 10 element, 3.9 m boom, balanced feed	\$190
2 5/8" co-linear 2 m vertical	\$135
Log periodic, 9 element, 13.60 m, 8.5 m boom	\$1,130
NEW 160 m vertical (suburban)	\$355
Multiband vertical, auto switch, 10/80 m,	\$360
40 m Yagi, 2 element, linear loaded, cap hats	\$645
6 m 5 element Yagi	\$310
26-29 MHz Yagi, dual drive, 3 element	\$270
70 cm Yagi, high gain, 3 metre boom	\$170
21.4 m mast, aluminium, stainless steel	\$4,500
13.5 m mast, aluminium, stainless steel	\$3,275
9.5 m fixed mast	\$1,260

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# WIA President visits Rockhampton

*Les Unwin VK4VIL*

Sunday 14 November saw representatives of amateur radio clubs throughout Queensland converge on Rockhampton to attend the annual Wireless Institute of Australia National President's State Luncheon. This is the first time the luncheon has been held outside Brisbane and held further significance, forming part of the WIA Centennial celebrations in the district.

WIA President, Michael Owen VK3KI, was accompanied by WIA Director Ewan McLeod VK4ERM and used the occasion to inspect Rockhampton and District Amateur Radio Club's new radio museum and communications room at the Rockhampton Regional Council's Heritage Village complex.

During the previous luncheon in Brisbane in 2009, Michael invited radio club presidents, without

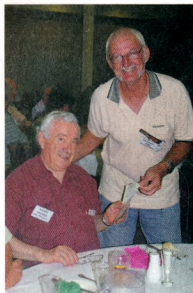
notice, to indicate what their club was doing to promote amateur radio. Reporting on a visionary initiative by local club member, Jeff Brett VK4NJB, Rockhampton Club President Jack Chomley VK4JRC indicated that plans were in place to build a museum and radio shack at the Rockhampton Heritage Village and that a suitable vacant building had already been allocated to the club.

Twelve months later, following a mountain of work by a number of club members led by stalwarts Mike Buchanan VK4LMB and Ray Dobinson VK4HOT, the museum is now operational, has already hosted numerous visitors and school classes and was used by the club to promote the hobby during the recent National Field Day.

While the museum boasts equipment dating back almost a century and includes a number of "living" displays, the radio room is fully operational with transceivers from the 70s to newly acquired rigs. The site is easily identified by the three



Jeff Brett VK4NJB and Bob Copeland VK4HRC at the Heritage Village promoting the WIA Centenary.



Michael Owen VK3KI, after delivering a heavy sales pitch (Hi Hi), accepts a WIA membership application from Ray Dobinson VK4HOT.

band, five element beam overseeing the village. Registered callsign VK4CHV (Capricorn Heritage Village) will be frequently heard during broadcasts and contests.



Rockhampton and District Amateur Radio Club President Jack Chomley VK4JRC doing presidential things.

Meetings on Monday morning with Rockhampton Regional Councillors to discuss further developments at the Heritage Village completed

Michael's and Ewan's visit to Rockhampton.

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WIA President Michael Owen VK3KI presents Mike Buchanan VK4LMB (responsible for much of Heritage Village site fit out) with Rockhampton Club long service medal.



Jeff Brett VK4NJB, Michael Owen VK3KI and Bob Copeland VK4HRC.

# **Geelong Amateur Radio Club - The GARC**

*Tony Collis VK3JGC*

In Geelong the UCI World Championships bicycle races were held late September early October which brought visitors from around the globe. One such visitor was Reinhard DF4TD.

Reinhard DF4TD contacted the club earlier in the year seeking advice and assistance with accommodation in the region, as he had been unable to book anything. The Club President received his email and was able to arrange something for him and his YL. Things worked out well as he was in town just in time for our Friday night meeting and he agreed to give us a talk after the meeting ended.

Reinhard showed us some photos and spoke about the 2002 ZL7C DXpedition in which he was involved with 11 colleagues to Chatham Island, off the SE coast of New Zealand. He recalled that there were around 70,000 contacts made on all bands and in various modes. It was a tremendous pleasure to have him visit our club and his talk was well received with many questions following. He spoke English very well and attributes his grasp of the language to contacts on amateur radio over many years. Reinhard is very keen operator on SSB on the 17 m band so keep an ear out for him.

## **A Virtual General Meeting**

On one occasion it was not possible to hold a conventional monthly general meeting as President Dallas VK3DJ and Secretary Tony VK3JGC were both out of the country; the former being in the USA and the latter in England. However with the combination of IRLP and Skype, contact was established with the membership.

## **The Atlanta Radio Club and the GARC**

Originally known as the "Atlanta Wireless Club," the Atlanta Radio Club, W4DOC, will celebrate its 100th anniversary in 2011. The ARC is one of the oldest and largest amateur radio clubs in the United States. With over 150 members, the Club sponsors numerous activities and services for its membership and for the Atlanta area amateur radio community.

The visit by Dallas to the USA and specifically the Atlanta Radio Club and his meeting with their President Bert Bruner KE4FOV and some of the Board of Directors of the club, is being progressed to explore the synergy that exists between the two clubs in both the technical and operational front. Because of the 15 hour time difference, it has been down to the GARC's IRLP node at VK3RGC to establish traffic between the two clubs.

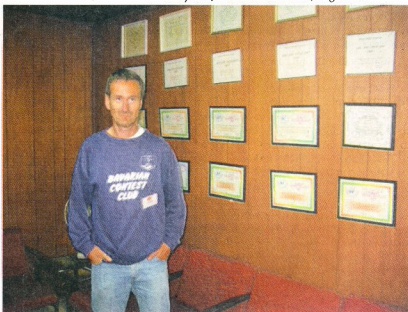
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*Dallas VK3DJ in Atlanta, USA.*



*Tony VK3JGC in Bedfordshire, England.*



*Reinhard DF4TD in the GARC Club House.*



Season's Greetings to all as our Centenary year draws to a close. One of the newer clubs in VK2 is the **Port Stephens ARC Inc.** Based on the lower North Coast, they meet monthly on the first Sunday at the 'Marine Rescue' station, formerly the Coast Guard Station in Whitbread Drive, Lemon Tree Passage. They meet mid morning, have a chat, lunch and the afternoon is training or a lecture. Their website is [portstephensarc.org](http://portstephensarc.org) or contact President - Richard VK2FRKO at [vk2frko@wia.org.au](mailto:vk2frko@wia.org.au). **St. George ARS** recently obtained a set of AWA RT85 VHF radios, reprogrammed to 10 watts, for their Foundation members. St. George was one of many VK2 clubs which put on a public display during their three days of VK100WIA operation.

The **Walcha Radio Club** in conjunction with the **Orana Region ARC** conducted assessments in early October at Dunedoo in the VK2 central west. The three candidates were successful. A reminder that the **Mid North Coast ARC** meet monthly for lunch, followed by a meeting, on the last Sunday. Each month is at a different location within the region. Their 2011 EXPO will be at the end of January - Sunday 30th - at the regular venue in Coffs Harbour. Details on their website [www.mncarg.com](http://www.mncarg.com) or mail via PO Box 463 Toormina NSW 2452. They can be contacted for exam assessments. **Liverpool & District ARC** meet on the second Wednesday. The secretary is Garry VK2BR on 0427 063 553 or email [vk2tsr@bigpond.com](mailto:vk2tsr@bigpond.com). **Hornsby & District ARC** have changed their VK2RNS 7250 repeater tone to 91.5 Hz. Their meetings for the year have finished. [www.hadarc.org.au](http://www.hadarc.org.au) The **Central Coast Hamfest** at the Wyong Racecourse Sunday 27 February. Phone contact 02 4340 2500. Web site [www.ccarc-hamfest.org.au](http://www.ccarc-hamfest.org.au)

While the annual RD Contest has been with us since 1948, the question of the starting time was raised recently by Grahame VK2FA who operates with a group as a field operation. They consider an earlier start and an earlier finish would be desirable. They could break camp in daylight. You may have an opinion on this which you could convey to Grahame at [vk2fa@wia.org.au](mailto:vk2fa@wia.org.au)

The **Hunter Radio Group** conduct their Monday night news net VK2AWX at 1930 hours. Their final transmission for the year is Monday 6 December and the final meeting will be Friday 10 December. They resume the net on Monday 7 February and the first 2011 meeting is Friday 11 February. Late December and through January the VK2BWI slow Morse session on Thursday evening, conducted by Ross VK2ER at Orange on behalf of ARNSW, takes a break. Additional operators are most welcome.

A new map service has appeared on the internet - similar in concept to Google Earth. It is provided by aerial photography and so far covers Australian capital cities and a few country locations. The clarity is excellent and for most areas there are regular updates. The old views remain available so you can check back on changes. You can even keep an eye on your neighbours, and they in turn on you. The site is to be found at [nearmap.com](http://nearmap.com)

**Amateur Radio NSW** wound up its Centenary year with the November Trash & Treasure at the VK2WI Dural site.

There had been thoughts of having it as a Mini Field Day but this was deferred until a date to be determined in 2011. **VK2WI News** will move into the summer session, with morning only bulletins for three Sundays commencing on December 26. The evening bulletin resumes on January 16.

The ARNSW Trash & Treasure dates for 2011 are scheduled as January 30, March 27, May 29, July 31, September 25 and November 27. Looking for some Xmas gifts? There are a few of the WI of NSW Centenary Plates and Mugs remaining. A photo of these appeared mid year in AR. Details and inquiries via the office phone 02 9651 1490 - leave a message and your contact details. They can also be obtained Sunday morning at VK2WI.

ARNSW Education Officer Terry VK2UX advises a training course will commence at the Dural site in March 2011, on a Monday evening. The library is still being set up. There is a lot of sorting to be done as the boxing of books and magazines in the move from Parramatta disrupted the former neat arrangements. There is a request for recent back copies of *Amateur Radio* magazine. Gaps have been identified since 2006 in the shelf copies and spares. If you no longer need your copies, the library would be grateful for them. They can be bought to a T&T event or to the morning broadcasts at 63 Quarry Road, Dural. Thank you.

In the early days of the Novice licence, the Education Service arm of the NSW Division produced a range of publications. The Service no longer operates but many of the publications remain. The publications include 100 Basic Electronic Projects; Novice Electronics; 500 Questions for AOCPC Candidates and Learning Morse Code which includes three cassette tapes. In limited quantities is 1000 Questions [for Novice candidates]. The material in these publications is still useful and has been made available to many of the VK2 clubs for giving to their Foundation candidates and others. If your club would like to obtain some - contact ARNSW via the office phone 02 9651 1490 or write to P.O. Box 6044 Dural Delivery Centre NSW 2158. They have to be collected from Dural. A set of the five books and tapes weigh 900 grams. Details can be found on the ARNSW web site [www.arnsw.org.au](http://www.arnsw.org.au) if you look in the 'Morse Practice Transmissions' sub heading.

There are also a few copies of *Halcyon Days* by Alan Shawsmith VK4SS which covers the story of amateur radio in VK4, Queensland, Australia, published in 1987.

This year ARNSW opened its time capsule created at the 75th Anniversary in 1985 and the contents are now displayed in the Centenary Building at Dural. A new "Time Capsule" for the next 25 years - for 2035 - has been started and will be closed off in March 2011. Anyone who wishes to contribute something - eg a QSL card - should get it to VK2WI Dural by post or hand delivery.

On behalf of the **Committee of Amateur Radio New South Wales**, may I wish members all the best for the festive season and all the best for 2011 - may the bands and DX improve.

73 - Tim VK2ZTM.

# Gridsquare Standings at 15 October 2010

Guy Fletcher VK2KU

## 144 MHz Terrestrial

VK2FLR	Mike	116
VK3NX	Charlie	106
VK2KU	Guy	102
VK3PF	Peter	88
VK3HZ	David	87
VK2ZT	Steve	81 SSB
VK2ZAB	Gordon	78 SSB
VK5AKK	Phil	78 SSB
VK2DVZ	Ross	77 SSB
VK3PY	Chas	73 SSB
VK3BDL	Mike	65 SSB
VK7MO	Rex	65
VK2EI	Neil	64
VK3QM	David	63 SSB
VK2TK	John	62
VK2MER	Kirk	61 SSB
VK3BJM	Barry	61 SSB
VK4FNQ	John	59
VK4FNQ	John	58 SSB
VK3II	Jim	56
VK3II	Jim	55 SSB
VK3WRE	Ralph	55 SSB
VK5BC/p	Brian	55 SSB
VK2AMS	Mark	54 SSB
VK3PF	Peter	54 SSB
VK5BC	Brian	53 SSB
VK3ZLS	Les	51 SSB
VK4CDI	Phil	49
VK3HY	Gavin	48
VK3VG	Trevor	46 SSB
VK7MO	Rex	46 SSB
VK4CDI	Phil	45 SSB
VK7MO	Rex	45 Digi
VK4KZR	Rod	43
VK4TJ	John	41 SSB
VK3PF	Peter	39 Digi
VK3EJ	Gordon	36 SSB
VK2TK	John	35 SSB
VK2KOL	Colin	34 SSB
VK3DMW	Ken	34
VK6HK	Don	34
VK2TG	Bob	33 SSB
VK3ZUX	Denis	33 SSB
VK1DA/p	Andrew	31
VK1WJ	Waldis	28
VK2TK	John	27 Digi
ZL3TY	Bob	24
VK1WJ	Waldis	23 Digi
VK3TLW	Mark	23 SSB
VK4EME	Allan	23
VK3BG	Ed	22 SSB
VK3II	Jim	21 Digi
VK4CDI	Phil	21 Digi
VK3ECH	Rob	20 SSB

VK6KZ	Wally	20
VK4EME	Allan	19 SSB
VK3AL	Alan	18 SSB
VK6KZ/p	Wally	16
VK4EME	Allan	12 Digi
VK2EI	Neil	11 Digi
VK5APN	Wayne	11
VK2KOL	Colin	9 Digi
VK2ZT	Steve	9 Digi
VK1WJ	Waldis	7 SSB
VK5APN	Wayne	6 SSB
VK5APN	Wayne	6 Digi
VK6HK	Don	6 Digi
VK1WJ	Waldis	5 CW
VK2AMS	Mark	5 Digi
VK4AE	Denis	5 SSB
VK4JAZ	Grant	4 FM
VK2DVZ	Ross	2 Digi
VK3QM	David	1 Digi
VK4FNQ	John	1 FM

## 144 MHz EME

VK2KU	Guy	410
VK2KU	Guy	396 Digi
ZL3TY	Bob	373
VK3AXH	Ian	265 Digi
VK4CDI	Phil	218 Digi
VK7MO	Rex	156 Digi
VK2FLR	Mike	120
VK2KU	Guy	43 CW
VK3DDU	Paul	39 Digi
VK5APN	Wayne	34 Digi
VK2ZT	Steve	28 Digi
VK3HZ	David	19
VK3II	Jim	14 Digi
VK3NX	Charlie	5 CW
VK4EME	Allan	5 Digi
VK3AXH	Ian	3 CW
VK2DVZ	Ross	2 CW
VK3AXH	Ian	1 SSB

## 432 MHz Terrestrial

VK2ZAB	Gordon	57 SSB
VK3NX	Charlie	50 SSB
VK3PY	Chas	50 SSB
VK3QM	David	48 SSB
VK3ZLS	Les	40 SSB
VK2KU	Guy	38
VK3BJM	Barry	38 SSB
VK3HZ	David	38
VK5AKK	Phil	38 SSB
VK2DVZ	Ross	34 SSB
VK2ZT	Steve	32 SSB
VK3BDL	Mike	32 SSB

VK3WRE	Ralph	32 SSB
VK3PF	Peter	30
VK3PF	Peter	29 SSB
VK5BC	Brian	26 SSB
VK1DA/p	Andrew	24
VK2MER	Kirk	24 SSB
VK3VG	Trevor	20 SSB
VK5BC/p	Brian	20 SSB
VK7MO	Rex	20
VK2TK	John	18
VK7MO	Rex	18 SSB
VK2AMS	Mark	17 SSB
VK2TK	John	17 SSB
VK3BG	Ed	15 SSB
VK3TLW	Mark	15 SSB
VK3ZUX	Denis	15 SSB
VK4KZR	Rod	15
VK4CDI	Phil	14
VK4CDI	Phil	14 SSB
VK6KZ	Wally	13
VK2EI	Neil	12 SSB
VK2KOL	Colin	12 SSB
VK4TJ	John	11 SSB
VK2TG	Bob	10 SSB
VK3AL	Alan	10 SSB
VK3ECH	Rob	10 SSB
VK4FNQ	John	10 SSB
VK6KZ/p	Wally	8
VK7MO	Rex	7 Digi
VK3DMW	Ken	6
VK4EME	Allan	6 SSB
VK1WJ	Waldis	5 SSB
VK3PF	Peter	4 Digi
VK3PY	Chas	4 Digi
VK3QM	David	4 Digi
VK4CDI	Phil	4 Digi
VK2ZT	Steve	3 Digi
VK4AIG	Denis	3 SSB
VK4JAZ	Grant	3 FM
VK2DVZ	Ross	1 Digi
VK2KOL	Colin	1 Digi
VK2TK	John	1 Digi

## 432 MHz EME

VK4CDI	Phil	30 Digi
VK4EME	Allan	23 Digi
VK7MO	Rex	10
VK7MO	Rex	9 Digi
VK3NX	Charlie	5 CW
VK3AXH	Ian	4 Digi
VK3HZ	David	4
VK4EME	Allan	4 CW
VK2ZT	Steve	3 Digi
VK5BC	Brian	1



## 1296 MHz Terrestrial

VK3PY	Chas	39 SSB
VK3QM	David	39 SSB
VK3NX	Charlie	37 SSB
VK2ZAB	Gordon	29 SSB
VK2DVZ	Ross	26 SSB
VK3ZLS	Les	26 SSB
VK2KU	Guy	25
VK5AKK	Phil	24 SSB
VK3PF	Peter	20
VK3BJM	Barry	19 SSB
VK3KWA	John	19
VK3PF	Peter	19 SSB
VK3BDL	Mike	17 SSB
VK3HZ	David	17
VK3WRE	Ralph	17 SSB
VK2ZT	Steve	12 SSB
VK3VG	Trevor	12 SSB
VK4KZR	Rod	12
VK3BG	Ed	11 SSB
VK5BC	Brian	11 SSB
VK7MO	Rex	11 SSB
VK1DA/p	Andrew	10
VK2TK	John	10 SSB
VK5BC/p	Brian	9 SSB
VK3TLW	Mark	8 SSB
VK2AMS	Mark	7 SSB
VK3AL	Alan	7 SSB
VK3DMW	Ken	7
VK2MER	Kirk	6
VK3ECH	Rob	6 SSB
VK3ZUX	Denis	5 SSB
VK4CDI	Phil	5
VK4CDI	Phil	5 SSB
VK4TJ	John	5 SSB
VK6KZ/p	Wally	5
VK6KZ	Wally	4
VK4EME	Allan	3 SSB
VK7MO	Rex	3 Digi
VK3PF	Peter	2 Digi
VK3QM	David	2 Digi
VK4AIG	Denis	2 SSB
VK4CDI	Phil	2 Digi
VK4FNQ	John	2 SSB
VK2EI	Neil	1 SSB
ZL3TY	Bob	1 SSB

## 1296 MHz EME

VK3NX	Charlie	52 CW
VK4CDI	Phil	51
VK4CDI	Phil	42 Digi
VK7MO	Rex	41
VK7MO	Rex	36 Digi
VK4CDI	Phil	12 CW

## 2.4 GHz Terrestrial

VK3PY	Chas	18 SSB
VK3NX	Charlie	17 SSB
VK3QM	David	17 SSB
VK3WRE	Ralph	11 SSB
VK3PF	Peter	7 SSB
VK3HZ	David	5
VK4KZR	Rod	4
VK6KZ	Wally	4
VK3BJM	Barry	3 SSB
VK1DA/p	Andrew	2
VK2AMS	Mark	2 SSB
VK2EI	Neil	2 SSB
VK3PF	Peter	2 Digi
VK2DVZ	Ross	1 SSB
VK2GG	Dan	1
VK3BG	Ed	1 SSB
VK3TLW	Mark	1 SSB
VK3ZUX	Denis	1 SSB

## 2.4 GHz EME

VK3NX	Charlie	36 CW
VK7MO	Rex	14
VK7MO	Rex	10 Digi

## 3.4 GHz Terrestrial

VK3NX	Charlie	14 SSB
VK3QM	David	14 SSB
VK3WRE	Ralph	8 SSB
VK3PF	Peter	6 SSB
VK6KZ	Wally	4
VK2EI	Neil	1 SSB
VK2GG	Dan	1

## 3.4 GHz EME

VK3NX	Charlie	16 CW
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## 5.7 GHz Terrestrial

VK3NX	Charlie	14 SSB
VK3QM	David	12 SSB
VK3WRE	Ralph	9 SSB
VK3PY	Chas	8 SSB
VK3PF	Peter	7 SSB
VK6KZ	Wally	4
VK2GG	Dan	2
VK3BJM	Barry	2 SSB
VK3PF	Peter	2 Digi
VK6BHT	Neil	2 SSB
VK2EI	Neil	1 SSB
VK3ZUX	Denis	1 SSB

## 5.7 GHz EME

VK3NX	Charlie	23 CW
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## 10 GHz Terrestrial

VK3HZ	David	24
VK3PY	Chas	15 SSB
VK3NX	Charlie	14 SSB
VK3QM	David	14 SSB
VK3PF	Peter	9 SSB
VK3WRE	Ralph	9 SSB
VK6BHT	Neil	9 SSB
VK2EI	Neil	6
VK6KZ	Wally	5
VK2EI	Neil	3 Digi
VK3TLW	Mark	3 SSB
VK7MO	Rex	3
VK2GG	Dan	2
VK3BJM	Barry	2 SSB
VK3DMW	Ken	2
VK3ZUX	Denis	2 SSB
VK4KZR	Rod	2
VK1DA/p	Andrew	1
VK3BG	Ed	1 SSB

## 10 GHz EME

VK3NX	Charlie	15 CW
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## 24 GHz Terrestrial

VK3NX	Charlie	4 SSB
VK3QM	David	3 SSB
VK6BHT	Neil	3 SSB
VK2EI	Neil	2 SSB
VK6KZ	Wally	2
VK2GG	Dan	1

## 47 GHz Terrestrial

VK3NX	Charlie	3 SSB
VK3QM	David	3 SSB
VK2GG	Dan	2

## 474 THz

VK3WRE	Ralph	3
VK3HZ	David	2
VK7MO	Rex	2
VK7MO	Rex	2 Digi
VK7TW	Justin	2
VK7TW	Justin	1 Digi

Additions, updates and requests for the guidelines to Guy VK2KU.

The guidelines (and the latest League Table) are also available on the VK VHF DX Site at <http://vhfdx.radiocorner.net> - click on Gridsquares.

Next update of this table will close on or about 11 February 2011.

Stations who do not confirm their status for more than 12 months may be dropped from the table. **ar**

# Silentkey

## Colin Geoffrey Harvey VK1AU Group Capt. (Ret.)

Also ex VK3UO, VK2AQU, VS1AU, 74 years an amateur and 1<sup>st</sup> Class Radio Operator. RAOTC Member #303. Born 25 September 1920. SK 22 August 2010.

Col certainly lived a full and most distinguished life. He grew up in Armadale Victoria and spent his early working career at 3DB as a sound engineer and radio announcer. He enlisted in the RAAF on 1st May 1939 as a wireless operator. On 8th Oct 1941 he was commissioned at the age of 18. This started a career which spanned some 29 years and ended in his retirement in 1971. In June 1942 Col was posted to 30 Squadron (Beaufacturers) as the Flight Commander's navigator. He also ferried aircraft between Australia and New Guinea. Colin completed seven 'strikes' before being hospitalised with malaria. On discharge from hospital, he joined 24 Squadron.

Colin was then re-posted back to 30 Squadron and served in Port Moresby and Milne Bay completing 85 sorties. Col was mentioned in dispatches in June 1944. From 1944-47 he worked closely with civil defence contractors including working on the SA rocket range. After the war Colin remained with the Air Force. In 1953, after training in Britain, he was part of the air crew that flew the first Canberra bomber to Australia as part of the London to Christchurch air race. They were winning until suffering a blow out on the coral runway of Cocos Island. In 1957 Colin was promoted to the rank of Wing Commander. By 1959 Colin had accrued some 2777 flying hours in numerous planes including the Canberra bomber, Dakota, Hastings, Lincoln, Neptune, Wirraway and Beaufighter. An entry in his Service record sums Col up to a tee "He has carried out any task I have asked him to do efficiently. I am aware that his attitude is not always appreciated by others, but in fact I cannot recall when he has been wrong in his views."

After retirement from the RAAF in 1971, Colin worked for Olims in Sydney managing a factory producing high quality tapes. After two years he returned to Canberra to work as a technician at Canberra radio station 2CA. He continued this work for four or five years until resigning to

ensure that another worker, nearly eligible for long service leave, was not terminated. That summarises the sort of man Col was throughout his life. Col also operated Southside electronics, selling and repairing sound equipment, tapes and TVs.

Col had a passion for sailing beginning during a posting to Singapore. Col purchased a Snipe class yacht and crewed for his son Peter. He brought the boat back to Canberra in early 1964 to a half-full Lake Burley Griffin. Col and Peter won the first ever race on handicap on 15 March 1964. Peter and Col also salvaged and repaired an old 505 yacht in 1965 and sailed it in the Australian and World titles in Adelaide in 1966. In 1967 they finished fourth in the Australian Titles held in Canberra.

Col sailed much of Australia competing in South Australia, Victoria, NSW and Canberra. At 48 Col gave up his sailing and put his efforts into race support at the Canberra Yacht Club. He became a rescue boat driver and maintained the boats and communication equipment for many years. Col's efforts were recognised when he was awarded Clubman of the Year in 1981-82, aged 61 years.

Col's amateur radio activity was similarly distinguished. I first met Col on the air when he was stationed in VS1 and maintained weekly contact for nearly 50 years. I initially knew his first better than his voice. He was a qualified First Class Radio Certificate Operator who had a passion for CW and broadcast quality phone. He was never short of providing 'helpful guidance' to operators whose transmissions could be improved! He initially designed and built most of his equipment to exceptional standards.

He was one of the early pioneers of 'Donald Duck' (SSB) built with phasing type exciters and crystal filters. Col joined a pioneering group of SSTV enthusiasts and helped usher in the first 'fast scan SSTV'. This, in its day, was a huge advance from the long persistent P5 phosphor CRT displays.

Col had a strong interest in VHF and UHF and was one of the first participants in Aircraft Enhancement experiments between Canberra and

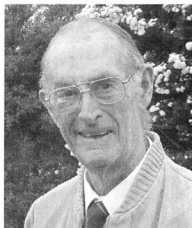


Photo by VK3UM.

Melbourne on 144 and 432 MHz. He was a regular operator on the Sunday CW net and always participated in the Old Timers Broadcasts.

Col also had a passion for research projects. He alone delved into the OT WIA members who 'got the chop', as he used to put it, and his research is the basis on today's WIA listing of amateurs that paid the supreme sacrifice. He was also accredited with the definitive history of radio traffic at the time of the sinking of the *Titanic*.

He was one of the foundation participants of the 7293 Group (stemming from the SSTV net) that has been running daily for over 35 years. This group consisted of VK2AIT (SK), VK2EE, VK2AS (SK), VK2APP (SK), VK4XV, VK2EAH, VK2ARZ and VK3UM (and the many others that dropped by over the years).

Col was a thorough gentleman, respected by all who had the pleasure to know him. You were never left wondering with Col; he said it as he saw it! A perfectionist in whatever he did, and a loyal friend.

He was married to Novar for 60 years (SK 2004) and later to Ruth for the last five enjoyable years of his life. He is the loved father of Christine (Chris Parks) and Peter and fondly remembered by Peter's partner Kerrie. He is the respected grandfather of Sallyanne, Michael, David, Karina, Cameron and Nigel.

SK Col, 73 de Doug VK3UM and Peter Harvey and his many friends of the ether.

Doug McArthur VK3UM

ar

October was another busy month for AHARS. Our monthly meeting was a construction night. As usual, Graham VK5ZFZ produced an interesting kit for us to put together.

It was a reflectometer or SWR bridge. The whole device was constructed on a piece of printed circuit board no more than 3 cm long and 1.5 cm wide.

Members had the experience of using surface mounted components, if they had not done so before. Magnifying lights or head-mounted magnifying lenses were much to the fore. However, even though some people did lose the tiny component that was the heart of the device, and about which they were warned, all were retrieved and successfully mounted.

A test set confirmed that most of the finished products worked, too.

There were several visitors to the meeting that night, including one from Canada, Jason VE7JMR. He is featured in the photo, with his host for the evening, Gerard VK5ZQV on his right and John VK5EMI, our President on his left.

By the time you read this column the "resistor bagging" day will be over and there will be one hundred and fifty bags of 8500 resistors of all the main values, gracing the benches of the VK5 amateurs. This activity has had to be rescheduled several times due to the late arrival of the resistors and the many other activities in which AHARS has been involved this month, so it has been something of a saga. Each bag will have 100 of each value of resistor in it, so it should be a while before they are all used. We expect lots of interesting projects to appear.

For the WIA National Field Day, AHARS participated in the Strawberry Fair Day at an Adelaide Hills primary school. Unfortunately not as many contacts were made as was hoped because there was a great deal of noise on 40 m during the day; however we had a number of people ask about amateur radio as a hobby.

On the Tuesday, Wednesday, and Thursday of the week following the Field Day, AHARS had their turn to hold the VK100WIA station.

By the time you read this, the AHARS Buy and Sell will have been held. We may be able to add some notes in a future issue.

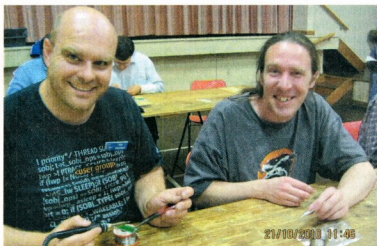
Season's greetings to everyone.

Christine VK5CTY.

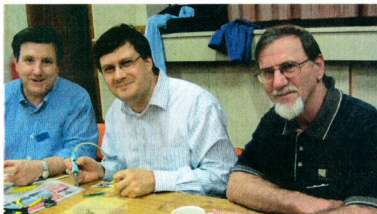
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Helpers at the Field Day: Lesley VK5LOL, Barry VK5BW, and John VK5EMI.



Kim VK5FNET and Dan, two of the three who provide the strong, willing muscles at each meeting to bring the trestles and chairs up from under the stage, and put them back. Others help but these do the heavy work. TNX



Gerard VK5ZQV, Jason VE7JMR/VK and John VK5EMI at the Construction Night.

# DXnews & views

John Bazley VK4OQ

E-Mail: john.bazley@bigpond.com

Well there has certainly been plenty of activity on all the HF bands during the recent creation of four new entities. If you missed one or two of them you will certainly have had another opportunity to work them during the CQWW SSB and CW Contests.

So this month let us start with the DXCC News:

The following operations have been approved for DXCC credit: 9Q50AR (Democratic Republic of the Congo, Club Station all operations), 9Q50ON (Democratic Republic of the Congo, 2010 operation), 9U1KI, 9U1RSI, 9U1VO and 9U4T (Burundi, 2010 operations); A51A (Bhutan, 2010 operation); T6MB (Afghanistan, 2010 operation).

Do not forget that The Microlite Penguins DXpedition team who will be activating the **South Orkney Islands** (DXCC VP8/O, IOTA AN-008) from January 27th to February 8th, 2011. Safe and reliable Antarctic transportation has been secured by the experienced RV Braveheart, and activity will be on all HF bands 160 m-10 m using SSB, CW and RTTY.

Operators will be K9ZO, ND2T, 9V1YC, K0IR, N1DG, N0AX, W3WL, N6MZ, I8NHJ, N4GRN, W89Z, W7EW and VE3EJ. This will be the team's fourth time activating an entity in the Antarctic region and fifth DXpedition overall. You may recognize most of the call signs from the group's past operations, but we have also added several new members to the team, all of whom have been on DXpeditions to some of the world's rarest entities.

We hear that Christian CX2CC is working for the United Nations in Goma, **Democratic Republic of the Congo** for one year. He plans to operate SSB, digital modes and QRS CW as 9Q50AR on 80-10 metres. QSL via home call (Christian Cardareello, Avenida Italia 3319, 11600 Montevideo, Uruguay). Cards will be answered "after January 2012".

Celebrating the 50th anniversary of the independence of the Democratic

Republic of the Congo, Patrick ON4HIL, Theo ON4ATW, Marc ON6CC, Luc ON4IA, Wim ON4CIT and Ronald PA3EWP will be active as 9Q50ON on 3-13 December. They will operate SSB and CW on 160-10 metres. QSL via ON4BR, direct or bureau. Further information can be found at [www.9q50on.be](http://www.9q50on.be)

Peter DG1FK (H40FK) and Sigi DK9FN (H40FN) will operate CW, PSK and RTTY from Nendo Island (OC-100) **Temotu** from 21 December to 3 January. They will have two stations with amplifiers, a wire pyramid for 160, 80 and 40 m and a 2-element beam for 30-10 m. QSL H40FK via DG1FK, QSL H40FN via HA8FW.

Rich 9M2MRS (PA0RRS) is back to **Penang Island** (AS-015) and will remain there until April 2011. He operates 99.9% CW. QSL via PA0RRS, whose new address is: Richard Smeets, Constance Gerlingsstraat 60, 5121 ZR Rijen, The Netherlands.

Stephen Welton G7BXU plans to go to **Sierra Leone** over Christmas and will have his FT-897 rig along and a G5RV. The operation is December 19-January 7.

**Pacific DXers** (<http://pacific-dxers.com>) was formed in September 2010 for anyone interested in Pacific DXing or DXing in the Pacific. "We already have a well stocked 'DXpedition Kit' available for members to use", says Eddie VK4AN. It will be made available on a booking basis for DXpeditions in the South Pacific area from 2011 onwards. They have also "negotiated a big reduction in price at a ham-friendly resort in Fiji for members staying at least a week, and are continuing negotiations with other resorts around the Pacific."

QSL 9J2CA: Phil, G3SWH says he is no longer the QSL manager for 9J2CA or 9I40CA, and he has no blank cards left.

Six Japanese ops will go to **Christmas Island**, VK9X, January 13-20. The group leaves Perth, Australia January 13th, operating on the island January

14-20 when they return to Perth. QSL to the JARL bureau or direct to each individual. <http://www.nakade.jp/vk9x.htm> The site is in Japanese but JA1ADN thinks the non-Japanese speaker will still be able to make some sense of it. Here are the callsigns:

JH3LSS VK9XXY, JA3BZO VK9XA, JA3AVO VK9XO, JH3PBL VK9XL, JI3DNN VK9XN, JA3UJR VK9XJR, JA3HJI callsign not yet assigned.

World traveller Vladimir Bykov UA4WHX has been in **Taiwan** recently as BW/UA4WHX. He says it is not an expedition and radio operation is not his top priority this time; it was a very casual, not serious, operating. Vladimir has not finished the QSLing from his African/Indian Ocean DXpedition of May, 2005 through June, 2007. He hopes to be caught up with all the QSLing by around Christmas, and says QRZ.COM "gives a fair update of the status of our QSLing." QSL are listed as "answered," country by country. If you have not received yours but see your country listed as "answered", contact Vlad so he can figure out what went wrong.

C6APT on **Abaco** in the Bahamas will be Pete K8PT November 27 to December 10. Pete plans to be active on various HF bands. QSL to his home call.

Nick G3RWF will be back in East Africa starting next month. First stop will be Nairobi, **Kenya**, where he plans to be QRV between November 24th and 28th as 5Z4LS, a call he has held since 1968. He will be using a K3 and ARSK antenna. Next he heads to **Uganda** and expects to be operating with his 5X1NH call from November 30th to December 13th. While on this trip, Nick plans to get a licence (for the future) from Rwanda (9X). QSL all via G3RWF.

Marty W2CG vacations on **Aruba** again, January 10-24. He will use his normal P40CG callsign but will be at a different QTH and is not sure of the "operating conditions" there. He

will have a rig with tuner and 33-foot (10 m) vertical. He expects most of his operating will be in early evening before dinner, 80-10 m including 30, 17 and 12, mostly CW but Marty will go to SSB on request. The log will be on LoTW and he will QSL 100% if you send to him direct or via the bureau to W2CG. No eQSL. US stations send an SASE for direct.

VP5/W5CW will again be on from the "VP5JM Hamlet" on **Providenciales**, November 24-December 14. He will get into the CQWW DX CW November 27-28, the ARRL 160 December 3-5 and the ARRL 10 m Contest December 11-12. QSL to his home callsign, the QRZ.com address.

Don CP4DR (KV7Q) and Diana CP4DL (KD7TO) are in the mining business in southern **Bolivia** and will be living there full time the next year or two. Look for them 80-10 m SSB and CW. QSL via the bureau or direct to their home calls.

Martin DL5RMH will be in Guatemala and QRV as TG9/DL5RMH from December 16 to January 13, 2011.

Listen for him on CW on 7 through 28 MHz. 30 metres is his favourite band. QSL via DL5RMH.

Hiro JF1OCQ (ZL1WY, W1VX) is heading back to **Chatham Island** (OC-038). Plans are to be QRV as ZL1WY/ZL7 from December 2nd to 9th. Activity will be on CW, SSB and the digital modes on 1.8 through 50 MHz, with an emphasis on Topband and the Magic Band. He will have a breakable beacon QRV "around the clock" on 50.117 MHz. QSL via JF1OCQ.

8J1RL - **Antarctic**: Otani JESXYT will be active with this call from the Syowa Antarctic Station on Ongul Island (AN-015) until February

2011. Ask the Op for QSL route.

The **Cocos (Keeling) Islands** is the destination of DXpeditioners Phil Whitchurch G3SWH and Jim Kellaway G3RTE. The two plan to be QRV from the West Island as VK9C/G6AY on 3.5 through 28 MHz on CW only from February 22nd to March 5th of next year. There will be no 160 or 6 metre or EME activity. The Cocos (Keeling) Islands (OC-003) ranks number 75 world wide. "Propagation permitting, we plan to have two stations on the air for as many hours every day as is possible" says Phil. Their focus will be on Europe, North America and ROTW (rest of the world) and have a goal of 15,000 QSOs. Phil says "This will be a very expensive DXpedition. We are happy to meet the costs of transport to and from the islands, but are seeking sponsorship and donations from individuals, DX clubs and organisations towards our living expenses on the island, printing QSLs and the like". They have a web page with more details at [www.g3swh.org.uk/vk9c-g6ay.html](http://www.g3swh.org.uk/vk9c-g6ay.html) QSL VK9C/G6AY

via G3SWH either direct with SAE and "adequate return postage", via Phil's web site for a bureau reply or via the bureau.

Mark your calendar as the **Sable Island** (CY0) DXpedition has been rescheduled for next month. A very excited Randy N0TG tells us the group has "been able to put all the details together; the aircraft has been repaired and the Sable Island DXpedition is now expected between December 6th and 13th". More details are expected to be posted to their website at [www.CY0dxpedition.com](http://www.CY0dxpedition.com)

So Seasons Greetings to all and good luck in the pile-ups.

Special thanks to the authors of **The Daily DX** (W3UR), **425 DX News** (1I1QI) and **QRZ.DX** for information appearing in this month's DX News & Views. For interested readers you can obtain from W3UR a free two-week trial of The Daily DX from [www.dailydx.com/trial.htm](http://www.dailydx.com/trial.htm)

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**Kevin VK4KEV is now active daily on 40 m SSB from Macquarie Island as VK0KEV. QSL via JE1LET**

*The shack is the building on the top of the hill in the near centre of the photograph below. What a location!*

*The inset photo shows Mac the Penguin in the temporary shack, that's Mac at the left of the photo.*



# Contests

Craig Edwards VK8PDX  
vk8pdx@yahoo.com.au

## CONTEST CALENDAR

<b>December</b>	<b>5</b>	<b>Kiwi Digital Modes Group Twin Sprint Digital Contest</b>	<b>PSK31 &amp; RTTY</b>
	<b>11-12</b>	<b>ARRL 10 metre Contest</b>	<b>CW &amp; Phone</b>
	<b>17</b>	<b>OK DX RTTY Contest</b>	<b>RTTY</b>
	<b>18-19</b>	<b>Croatian DX Contest</b>	<b>CW</b>
<b>January</b>	<b>1-31</b>	<b>Ross Hull Memorial VHF/UHF</b>	<b>All</b>
	<b>8-9</b>	<b>ARRL RTTY Round-Up</b>	<b>RTTY</b>
	<b>15-16</b>	<b>Summer VHF-UHF Field Day</b>	<b>CW &amp; Phone</b>
	<b>22-23</b>	<b>UK DX RTTY Contest</b>	<b>RTTY</b>
	<b>29-30</b>	<b>CQWW 160 m</b>	<b>CW</b>

IT'S GROUND HOG DAY!!! Oh no, the Monday morning after CQWW RTTY I was finalising the November column to send and now the Monday morning after CQWW SSB I am doing the December issue! And in between all that there was an IOTA DXpedition to Fitzroy Island OC-172 for seven days operating as VK4LDP/P. I am surprised my wife has not killed me yet, especially as I will be off to Magnetic Island on OC-171 for a quick activation on December 10-12. Lucky there is no major contest event for me to do in the next few weeks until the ARRL RTTY Round-Up on January 8-9. Take note of the upcoming Summer VHF/UHF Field Day and the Ross Hull Memorial all coming up in January. Have a great festive season, may the QSOs, beer and QSLs flow freely.

### 2010 VK Shires Contest Results

Trent VK4TI has released the results of the 2010 VK Shires contest. Full results are available at <http://vkshires.cqcontest.org/Results-2010> and you can also find out about applying for the VK Shires Award at [www.vkshires.info](http://www.vkshires.info). Here is Trent's summary:

The second VK Shires contest saw high activity and some very pleasing results. Congratulations are in order for the award winners:

Catherine VK4GH won both the Single op and the Single Rover categories - Catherine and John went to a remote Northern NSW shire and gave out a new one to many from a portable location. As they did not move to a new shire Catherine qualified for both the Single op and the Single Rover category - a great effort.

VK2IM for the second year has won the VK5NJ Trophy for the most CW

contacts. Vlad seems to have the knack of rattling the key at the right pace to

## 2010 VK Shires Contest Results

Single Operator			
<b>VK4GH</b>	<b>62913</b>	<b>0</b>	<b>SO</b>
VK6NC	53580	0	SO
<b>VK2IM</b>	<b>52962</b>	<b>102</b>	<b>SO</b>
VK8PDX	48692	0	SO
<b>VK7FWAY</b>	<b>30600</b>	<b>0</b>	<b>SO</b>
VK5PO	29172	10	SO
VK3LDR	21840	0	SO
VK5LSB	20172	0	SO
VK3AVV	18000	0	SO
VK2IO	15762	0	SO
VK2HBG	15194	0	SO
VK2VVV	14985	0	SO
VK4MIT	13493	0	SO
VK4SN	10998	8	SO
VK2ACC	10647	0	SO
VK4BL	7896	0	SO
VK3FEMT	7533	0	SO
VK2WAY	7392	0	SO
VK2AR	6935	2	SO
VK3ZPF	6660	0	SO
VK4FREQ	6532	0	SO
VK3TDX	4950	0	SO
VK7JGD	4154	0	SO
VK2VJE	4140	0	SO
VK2TTL	2576	0	SO
VK2HV	2322	0	SO
VK4FABD	1880	0	SO
VK1MA	1710	0	SO
VK7AD	1512	0	SO
VK4FPDW	1188	0	SO
VK2MER	992	0	SO
VK3XEM	870	0	SO
VK2ACD	756	0	SO
VK3AJ/B	728	0	SO
VK6QM	528	0	SO
VK3AFK	400	0	SO
VK2WL	289	1	SO
VK4GF	270	0	SO
VK4PJC	270	0	SO
VK2GCE	255	0	SO
VK2XJG	208	0	SO
VK2UVP	154	0	SO
VK8HPB	36	0	SO
VK5OQ	36	0	SO
VK2NRA	36	0	SO
VK6DT	27	0	SO
Multi Two			
VK4ZD	71165	0	M2
VK2FFG	49068	0	M2
Single Rover			
VK4GH	62913	0	SO
VK4ADX	24360	0	SO
VK7GN	552	0	SO
Multi Op Rover			
VK2GR	1443	3	M2
Foundation			
VK7FWAY	30600	0	SO
VK3FEMT	7533	0	SO
VK4FREQ	6532	0	SO
VK4FABD	1880	0	SO
VK4FPDW	1188	0	SO



pile up those contacts and for the DX stations he must have been a pleasant surprise - the 40 m Moxon seemed to have been the big winner.

VK7FWAY Wayne put in a stellar performance to take top honours in the Foundation category. It must be in the water in Tasmania as there is always good activity from VK7 in the Shires contest but even more Wayne must have a pipeline to great signals.

VK4ZD (VK4HH) powered off with the Multi Two category - well done Bill and Dianne. That loop worked well on the low bands - after hearing Bill from VK2ATZ during the RD Contest, I understand why the multi contacts - a VK4ZD signal was awesome and the credit to the station owner - looks like

some of the other stations may have to challenge Bill and Di in 2011.

Mark VK4ADX went bush and set a new activation record for shires as well as second place in the Rover category. Overall Mark operated from nine Shires with both a mobile installation and an inverted V at a caravan park

The rules make this an interesting category as you are able to make repeat contacts from a new location. Mark saw the opportunity to activate many shires without much grief. Another who took the same option was Martin VK7GN who gave out some of those rarer Tasmanian shires.

Well done all and thanks to everyone who entered and submitted a log. See you all in 2011. VK4TI Trent

## ARRL 10 metre Contest

I mentioned this time last year about the possibility of this being a good event with improved solar conditions, hmmm, ok let us try again this year. It is on the second weekend of December and runs for 48 hours. The full details are at [www.arrl.org/10-metre](http://www.arrl.org/10-metre)

## CQWW 160 m Rules

The CQ World Wide CW contest will be held on the last full weekend of January. At press time, the rules for 2011 are not out yet so please visit [www.cq160.com/](http://www.cq160.com/) for the 2010 version.

**Deadline for Jan/Feb  
issue: December 29 to  
vk4ldx@yahoo.com.au**

# ARRL RTTY Round Up 2011 Rules

1. *Object:* Amateurs worldwide contact and exchange QSO information with other amateurs using digital modes (Baudot RTTY, ASCII, AMTOR, PSK31 and Packet -attended operation only) on 80, 40, 20, 15, and 10 meter bands.

Any station may work any other station. Stations may be worked once per band, regardless of mode.

2. *Date and Contest Period:* Begins 1800 UTC Saturday January 8, ends 2400 UTC Sunday January 9.

2.1. Operate no more than 24 hours.

2.2. The six hours of off time must be taken in no more than two blocks.

2.3. Stations are allowed only one transmitted signal at any given time.

3. *Entry Categories:*

3.1. Single Operator:

3.1.1. Low Power.

3.1.2. High Power.

3.1.3 Single Operator entrants may not use any form of spotting assistance such as from nets or packet. Single Operators that use assistance will be changed to the Multioperator, Single Transmitter category.

3.2. Multioperator, Single Transmitter:

3.2.1. This category also includes single operators that use any form of spotting assistance such as from nets or packet.

3.3. Power.

3.3.1. Low Power

3.3.2. High Power

3.2.3. Includes those that receive assistance with logging or relief operators, etc.

3.2.4. Multioperator stations are limited to 6 band changes (maximum) in any clock hour.

3.2.5. The clock hour is from zero through 59 minutes.

3.2.6. Band changes are defined so that, for example, a change from 20 metres 15 metres and then back to 20 metres constitutes two band changes.

4. *Exchange:*

4.1. United States: Signal report and State.

4.2. Canada: Signal report and Province.

4.3. DX: Signal report and consecutive serial number, starting with 001.

5. *Scoring:*

5.1. QSO Points: Count one point for each completed QSO.

5.2. Multipliers: Each US state (except KH6 and KL7) plus the District of Columbia (DC), Canadian provinces/territories: NB (VE1, 9), NS (VE1), QC (VE2), ON (VE3), MB (VE4), SK (VE5), AB (VE6), BC (VE7), NWT (VE8), NF (VO1), LB (VO2), NU (VY0), YT (VY1), PEI (VY2) and each DXCC country. KH6 and KL7 count only as separate DXCC entities.

5.2.1. Count only once (not once per band).

5.2.2. The US and Canada do not count as DXCC entities.

6. *Reporting:*

6.1. All entries are must be postmarked or emailed by 2359 UTC Tuesday, February 8, 2011.

6.2. Entries in electronic format may be submitted to RTTYRU@arrl.org or submitted on 3.5" diskette to

RTTY Round-Up, ARRL, 225 Main St, Newington, CT 06111.

6.3. All logs that are created electronically are required to submit their electronic log file in Cabrillo file format. A print out of an electronically generated log is not an acceptable substitute. A hand-written log that is later entered into a logging or other electronic program is considered an electronically generated log and must meet electronic file requirements.

6.4. The Cabrillo entries include the header and the complete QSO list.

6.5. Submissions may be made using the web applet at [www.b4h.net/cabforms](http://www.b4h.net/cabforms)

6.6. Hand-logged entries may be submitted to RTTY Round-Up, ARRL, 225 Main St, Newington, CT 06111.

*Miscellaneous:*

7.1. Packet radio contacts made through digipeaters or gateways are not permitted.

7.2. All ARRL Contest rules and forms may be obtained from the Contest Branch by sending an SASE with 2 units of postage.

7.3. For contest information contact [contests@arrl.org](mailto:contests@arrl.org) or (860) 594-0232

8. *Awards:*

8.1 Certificates will be awarded to:

8.1.1. Top high power and low power Single Operator and Multioperator scorers in each ARRL/RAC Section.

8.1.2. Top high power and low power Single Operator and Multioperator scorers in each DXCC country (other than WVE).



# SUMMER VHF-UHF FIELD DAY 2011 Contest Rules

Contest manager: John Martin VK3KM

The rules for this Field Day are the same as for the previous event.

## MICROWAVE CHALLENGE

One "optional extra" for the Summer Field Day is a special Microwave Challenge. All entrants in the 2011 Summer Field Day will receive certificates of the normal type, covering all bands as usual. However operators on 1296 MHz and higher bands are also eligible for special "Microwave Challenge" certificates.

These certificates will include details of the rank order of stations on 1296 MHz and higher bands, but they will also provide special recognition for DX contacts on the microwave bands.

For the special "Microwave Challenge" certificate, please include with your score sheet a list of the greatest distances you worked on each band 1296 MHz and above. Distances can be calculated using downloadable software that is on the WIA web site.

Dates: Saturday and Sunday 15 and 16 January 2011

Duration in all call areas other than VK6: 0100 UTC Saturday to 0200 UTC Sunday.

Duration in VK6 only: 0400 UTC Saturday to 0400 UTC Sunday.

Please note there is now a 3 hour difference between the eastern states and Western Australia, as daylight saving time no longer applies in WA.

## Sections

- A: Portable station, single operator, 24 hours.
- B: Portable station, single operator, 8 hours.
- C: Portable station, multiple operator, 24 hours.
- D: Portable station, multiple operator, 8 hours.
- E: Home station, 24 hours.
- F: Rover station, 24 hours.

**Operating periods:** Stations entering the 8 hour sections may operate for more than 8 hours, and nominate which 8 hour period they wish to claim for scoring purposes.

**Entering more than one section:** A portable station operating for more than 8 hours, may enter both the 24 and 8 hour sections. If the winner of a 24 hour portable section has also entered both sections, this log will be excluded from the 8 hour section.

If a portable or rover station spends part of the contest period operating from his home station, he may also enter the home station section.

**Two operators:** If two operators set up a joint station with shared equipment, they may choose to enter Section A or B as separate stations under their own call signs, or Section C or D under a single call sign. If they enter Section A or B, they may not claim contacts with each other.

**Multi-operator stations:** Portable stations with more than two operators must enter Section C or D. Operators of stations in Section C or D may not make contest exchanges using call signs other than the club or group call sign.

**Rover stations:** The Rover section is for all portable or mobile stations that operate from more than two locator squares or change locator squares more than twice.

## General Rules

One call sign per station. Operation may be from any location. A station is portable only if all of its equipment is transported to a place which is not the normal location of any amateur station. Portable stations may change location during the Field Day provided the station is dismantled and reassembled each time it moves. You may work stations within your own locator square. Repeater, satellite and crossband contacts are not permitted.

No contest operation is allowed below 50.150 MHz. Recognised DX calling frequencies must not be used for contest activity. Suggested procedure is to call on .150 on each band, and QSY up to make the contest exchange.

## Contest Exchange

RS (or RST) reports, a serial number, and your four digit Maidenhead

locator. The Maidenhead locator is optional if it has already been exchanged in a previous contact during the Field Day and neither station has moved since then.

## Repeat Contacts

Stations may be worked again on each band after three hours. If either station is moved to a new location in a different locator square, repeat contacts may be made immediately. If the station moves back into the previous locator square, the three hour limit still applies to stations worked from that square.

## Logs

Logs should cover the entire operating period and include the following for each contact: UTC time; frequency; station worked; serial numbers and locator numbers exchanged.

## Scoring

For each band, score 10 points for each 4 digit locator square in which your station operates, plus 10 points for each locator square worked, plus 1 point per contact. Multiply the total by the band multiplier as follows:

6 m	2 m	70 cm	23 cm	Higher
x 1	x 3	x 5	x 8	x 10

Then total the scores for all bands.

## Cover Sheet

The cover sheet should contain the names and call signs of all operators; postal address; station location and Maidenhead locator; the section(s) entered; the scoring table; and a signed declaration that the contest manager's decision will be accepted as final.

Please use the following format for your scoring table.

*Continued on page 47*

Band	Locators Activated (10 points each)	+	Locators Worked (10 points each)	+	QSOs (1 point each)	x	Multiplier	=	Band Total
6 m	10	+	40	+	40	x	1	=	90
2 m	10	+	40	+	30	x	3	=	240
70 cm	10	+	40	+	20	x	5	=	350
etc.									
Overall Total								=	680

# ROSS HULL MEMORIAL VHF-UHF CONTEST 2011 Contest rules

John Martin VK3KM, contest manager

The Ross Hull Contest will run through the month of January 2011. Logs will be due by Monday, February 14.

If you participate in the Summer VHF-UHF Field Day, remember that you can count Field Day contacts (one per station per band per day) in your Ross Hull Contest log.

## The Contest

The WIA maintains a perpetual trophy in honour of the late Ross A. Hull and his pioneering achievements in VHF and UHF operation. The name of each year's contest winner is engraved on the trophy, and other awards may be made in the various divisions of the contest. The contest is open to all amateurs.

**Duration:** 0000 UTC January 1, 2010 to 2400 UTC January 31, 2011. In Eastern Summer Time, that is 11 a.m. on January 1 to 11 a.m. on February 1.

### Sections

A: All bands, non-digital modes.

B: All bands, digital modes.

Digital modes are defined as those in which the decoding of the received signal is done by a computer.

Entrants may submit logs for one or both sections.

## General Rules

One callsign and one operator per station. Stations may operate from any location. You may claim one contact per station per band per UTC day. Repeat, satellite and crossband contacts are not permitted. No contest activity is permitted below 50.150 MHz. Recognised DX calling frequencies should be avoided where possible for contest activity. Suggested procedure is to call on .150 on each band, and QSY up to make the contest exchange. All rulings of the contest manager will be accepted as final.

## Contest Exchange

For Section A, Entrants must exchange RS (or RT) reports plus a serial number. Serial numbers need not be consecutive. *For propagation modes such as meteor scatter or short-lived sporadic E openings, it is sufficient to exchange callsigns plus two further digits that cannot be predicted by the other station.*

For Section B, exchange callsigns plus two further digits that cannot be predicted by the other station.

While not an essential part of the contest exchange, Maidenhead locators may also be exchanged as an aid to distance calculations.

## Logs

Logs must contain the following for each contact:

Date and UTC time.

Frequency and callsign of station worked.

Reports and serial numbers sent and received.

Approximate location or grid locator of station worked.

Separate scoring columns for each band would be helpful.

## Scoring

Scoring will be based on the best 7 UTC days nominated by the entrant.

For each contact, score 1 point per 100 km or part thereof

(i.e. up to 99 km: 1 point, 100 – 199 km: 2 points, etc.)

Multiply the total by the band multiplier as follows:

6 m	2 m	70 cm	23 cm	Higher bands
x 2	x 3	x 5	x 8	x 10

Then total the scores for all bands.

## Cover Sheet

Logs must be supplied with a cover sheet containing:

- Operator's callsign, name and address.
- Station location (if different from the postal address).
- Section(s) entered.
- A scoring table set out as the example below.
- A signed declaration that the station has been operated in accordance with the rules and spirit of the contest, and the contest manager's ruling will be accepted as final.

Please use the following format for your scoring table. If you wish you can cross-check by adding the daily totals across the table, but please make sure that you include the separate band totals.

Date	6 m	2 m	70 cm	23 cm	etc	
Day 1	xxx	xxx	xxx	xxx	xxx	
Day 2	xxx	xxx	xxx	xxx	xxx	
Total	xxx +	xxx +	xxx +	xxx +	xxx =	xxx (GRAND TOTAL)

A cover sheet and scoring table has been included in the postings on the WIA web site. Copies can also be obtained from the e-mail address given below.

## Penalties

Minor errors may be corrected and the score adjusted. Repeated use of recognised DX calling frequencies (especially when the reports indicate strong signals) may lead to disqualification. Inclusion of any false log entries will lead to disqualification.

## Entries

Paper logs may be posted to the Manager, Ross Hull Contest, 3 Vernal Avenue, Mitcham, Vic 3132. Electronic logs can be e-mailed to [vhf-contests@wia.org.au](mailto:vhf-contests@wia.org.au). Acceptable log formats include: ASCII text, RTF, DOC, DOCX, XLS, MDB, PDF, or any Open Document format.

Logs must be received by **February 14, 2010**. Early logs would be appreciated.

## Note on Calculating Distances

Absolute accuracy is not required. You just need to know whether each station is above or below the nearest multiple of 100 km, so you can use a compass to draw 100 km circles around your location on a map. A more accurate method is to use six-digit Maidenhead locators and a computer program that can be obtained from the WIA web site.

# 2010 Remembrance Day Contest Results

Peter Harding VK4OD

I received a total of 261 Logs compared to 312 last year, with two logs for the receiving section, one log in the WWII Equipment Rx only, and one in the VHF Rx only.

The overall points totalled 41,111 compared to last year's total of 42,453. This year I believe that we can attribute the slight drop in the number of logs to the Lighthouse Event and the RD Contest NOT falling on the same weekend this year. Unfortunately, this is going to occur from time to time.

This year, 190 of the logs were created electronically, the remainder that were posted, were either hand written or on the pre-designed forms that I made available. This made my task a lot easier and enabled a quick result.

Amongst this year's entrants were logs from eight "F" calls, compared to 21 "F" call logs in 2009. Well done to those "F" calls who participated. Next year we look forward to more and more "F" calls taking part.

Although many ZL contacts were made this year, we had only one log in from the "Land of the Long White Cloud". The Certificate will be posted to the ZL ASAP.

Prior to last year's contest, I received a few requests for a section to be made available for operators using WWII Radio Equipment. Disappointingly, we received only two logs for Transmit/Receive and one operator submitted a WWII Receive Only log. This year some of the entrants were from club stations running Single and Multiple Operators, Multi Modes and Multi bands.

It is no surprise that VK6 once again will be engraved on the RD Trophy as the Winning State for 2010, although the amateurs in VK5 really improved the points from last year. I am investigating a method to balance out the overall winning state for next year's contest.

Well done to all those who took the time and effort to enter the contest and also posted or emailed in their logs.

Below is a table of the breakdown of Logs and points, State by State for 2010 versus 2009.

State	2010		2009	
	Logs	Points	Logs	Points
ACT	12	2467	19	1934
NSW	30	5385	31	5498
VIC/O	30	3254	37	5373
QLD	38	4715	33	4414
SA/NT	45	8126	56	5981
WA	76	12,410	100	14,715
TAS	29	4754	36	4360
PNG	0	0	0	0
ZL	1	74	3	178
Totals	261	41,185	312	42,453

In order to balance out the winning State by State Scoring points, I am looking at ways to achieve this. Once I have worked it out I will get them published in AR well before the next RD in 2011.

Before the next RD rolls around I will have posted to those operators who hand wrote their logs several copies of a computer generated log sheet and cover sheet, as some of the hand written sheets took a fair amount of deciphering (but we got there).

By the time you read this in AR, all the certificates will have been sent out, to all the first, second and third place getters.

Should any questions arise from this year's contest, please email them to Peter Harding at vk4od@wia.org.au and I will do my best to answer your query.

Until next year.

Peter Harding VK4OD

## HF Multi Open 2-0-2-3

Call Sign	Score
VK4IZ	346
VK2AMW	276

VK3TX	35 ±
VK6AFW	24
VK2RJ	12

## HF Single Phone 2-0-1-1

Call Sign	Score
-----------	-------

VK2XN	814
VK4ZD	634
VK4GH	631
VK1HW	591
VK3BJA	373
VK4WIS	332
VK7OTC	217
VK4IZ	197
VK2AFY	167
VK5GRC	112
VK6SH	70
VK6AHR	6

Call Sign	Score
-----------	-------

VK2XN	814
VK4ZD	634
VK4GH	631
VK1HW	591
VK7FWAY	574
VK2HBG	508
VK1PAR	505
VK1MJ	388 ±
VK5CB	395
VK3AVV	377
VK6BJ	368
VK4KRX	330
VK4ATH	330
VK5BWH	319
VK2AOA	298
VK3AFK	257
VK2ACC	248

VK7JGD	244
VK7LG	238
VK1OO	235
VK4GQ	231
VK3YXC	222
VK1JA	202
VK7VKV	200
VK3WZ	200
VK2VJE	194
VK6YS	190
VK7KC	182
VK5OQ	181
VK5KBJ	177
VK6DT	171
VK4MON	166 ±
VK3ASU	167
VK3DET	160
VK2HZ	159
VK1LW	155
VK2BOR	144
VK2AQJ	144
VK4KKN	140
VK3ADW	140

VK1WX	136
VK3HAU	136
VK4ADC	135
VK4NH	132
VK4JRO	132
VK2YW	131
VK2EI	125
VK1DW	124
VK6QM	122
VK5DB	121
VK5FPAS	119
VK3YC	116
VK6CLL	115
VK7DIK	114
VK4BAY	110
VK2GX	106
VK5YX	105
VK5RV	102
VK3LM	101
VK5ALX	100
VK7VH	100
VK3HFS	98
VK2IG	93
VK2VTH	93

VK3KYF	88
VK6HRC	84
VK5SIG	83
VK5LOL	82
VK4GLC	81
VK6ADI	79
VK4ION	79
ZL4RMF	74
VK5KMK	74
VK6CG	73
VK7FM	73
VK1EY	72
VK2XDL	70
VK4ZW	67
VK7HW	66
VK6AB	60
VK4FLR	59
VK2AR	57
VK3JK	54
VK6CSW	52
VK5WO	52
VK6SO	50
VK2UVP	48

## HF Single CW 2-0-1-2

Call Sign	Score
VK5UM	78

VK6AR	45
VK4RY	44
VK3LRE	44
VK7AD	42
VK6YD	41
VK5SE	40
VK6DZ	39
VK7HDM	37
VK6FDX	37
VK2EXA	35
VK6JDM	35
VK3CTN	35
VK7OO	34
VK3MDX	32
VK5ZIG	32
VK4FK	32
VK6JP	32
VK3HV	30
VK7RM	30
VK2CKP	29
VK3YAZ	29
VK6MM	27
VK7ZGK	27
VK7BYL	26
VK5KLV	25
VK6WJ	25
VK3FDI	24
VK3AKT/4	24
VK3DY	24
VK6GD	23
VK5UE	21
VK4BW	18
VK3JWT	18
VK1CM	17
VK6FBDV	17
VK6GG	16
VK3KTM	16
VK4AR	16
VK4UD	16
VK2DCR	15
VK2WG	14
VK5DJ	12
VK7KZ?	10
VK4MAX	10
VK5VCO	9
VK5NE	9
VK4AJL	8
VK6AXB	7
VK6IW	5
VK5AKH	3

#### HF Single Open 2-0-1-3

Call Sign	Score
VK7GN	798
VK7ZE	772
VK3VWW	61

#### HF Single RX 2-0-1-4

Call Sign	Score
VK6ABM	70

#### HF WWII Single Phone 2-1-1-1

Call Sign	Score
VK2ABN	129
VK4AAT	58

#### HF WWII Single RX 2-1-1-4

Call Sign	Score
VK2VEL	16

#### VHF Multi Phone 1-0-2-1

Call Sign	Score
VK5LZ	582
VK6RRG	327
VK3BJA	222
VK5GRC	66
VK4WIS	64
VK6AHR	36

#### VHF Single Open 1-0-1-3

Call Sign	Score
VK5AIM	329
VK5ZW	15

#### VHF Single Phone 1-0-1-1

Call Sign	Score
VK5NE	799
VK6BDO	691
VK6PIG	684
VK5ZT	671 ±
VK6NAH	660
VK5AKH	535
VK6USB	517
VK5VCO	460
VK6KHZ	460
VK6FMON	435
VK5NI	387
VK5HZ	375
VK6KYF	354
VK6GO	354
VK6FIVE	338
VK6SAA	338
VK6SCS	337
VK6LZ	311
VK6CSW	302
VK7OTC	280
VK6GG	268
VK6KTV	265
VK6AXB	265
VK6NU	245
VK5ZD	242
VK5KBJ	240
VK6ST	237
VK6FDX	230
VK7HDM	224
VK6YS	220
VK6YD	211
VK6HAD	209
VK6JP	202
VK5AR/M	201

VK6MM	184
VK6CLL	184
VK6GD	178
VK7OO	177
VK5FXYL	158
VK6OTN	134
VK6WJ	134
VK5KLD	134
VK6HDX	131
VK3JK	130
VK6WIA	127
VK6KMC	117
VK5FSKS	106
VK7RM	103
VK6CN	101
VK6ZKO	100
VK4ADC	83
VK5APA	76
VK6ZLZ	75
VK5LD	73
VK6AR	69
VK7ZGK	65
VK6AB	62
VK6OE	59
VK4OE	59
VK6AAL	58
VK6HRC	58
VK4ZA	54
VK6KG	53
VK4ZW	50
VK6ZSB	50
VK6AN	42
VK7JGD	40
VK6YF	39
VK1DW	38
VK7PAH	36
VK5ZKK	35
VK3JWT	35
VK4AR	31
VK6ZMS	27
VK5RV	26
VK6TS	26
VK6FJA	23
VK7VKV	21
VK4RY	15
VK7HW	13
VK7VH	11
VK4GLC	8
VK3KTM	6
VK2EI	6
VK4ION	6
VK2YW	5
VK1EY	4
VK5CB	4
VK4UD	4
VK4HJE	4
VK2ZCW	3
VK4BW	3

#### VHF Single RX 1-0-1-4

Call Sign	Score
VK5FPAW	361

### The Westlakes Contest Cup Results

Another one has gone by for the Westlakes Cup Contest. Sorry I was not present for the occasion and operating the Station. Many thanks to those who held the reins for me: Paul VK2HV and Dave VK2RD.

Overall first place to Bill VK4ZD.

Foundation first place to Leonie VK2FHRK. Congratulations to the winners.

Please note that last year's winner for the Foundation category has upgraded and there were no bonus points allocated for Foundation in this year's 2010 Westlakes Cup Contest.

Note: If I could have been present at the preamble I would have nominated last year's Foundation runner-up callsign for the bonus Foundation callsign.

All logs received for the contest that did not win will receive a participation award. Trophies for the winners will be sent by post.

Allan Brown VK2JED

Westlakes Contest Coordinator 2010.

*Continued from page 44*

## SUMMER VHF-UHF FIELD DAY 2011 Contest Rules

In this example the operator has operated from one locator and worked four locators on each band:

A blank cover sheet, with scoring table, is available on the Field Day page of the WIA web site.

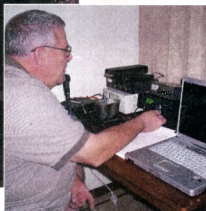
Entries

Paper logs may be posted to the Manager, VHF-UHF Field Day, 3 Vernal Avenue, Mitcham, Vic 3132. Electronic logs can be e-mailed to [vfh-contests@wia.org.au](mailto:vfh-contests@wia.org.au). Acceptable log formats include: ASCII text, RTF, DOC, DOCX, XLS, MDB, PDF, or any Open Document format. Logs must be received by **Monday, 7 December 2010**. Early logs would be appreciated.

FIELD DAY WEB SITE – <http://www.wia.org.au/members/contests/vfhuh/>

This site includes the rules for the next Field Day, rules and results of all past VHF-UHF Field Days, cover sheets and scoring tables, and other information.

## Shires Contest winners



*Mark VK4ADX went bush and set a new activation record for shires as well as second place in the Rover category. Overall Mark operated from nine Shires with both a mobile installation and an inverted V at a caravan park.*

*The rules make this an interesting category as you are able to make repeat contacts from a new location. Mark saw the opportunity to activate many Shires without much grief.*



*VK7FWAY Wayne put in a stellar performance to take top honours in the Foundation category. It must be in the water in Tasmania as there is always good activity from VK7 in the Shires contest but even more important Wayne must have a pipeline to great signals.*

*Fourth overall and with more than four times the points of the next Foundation licence holder is a great effort.*

Keith Bainbridge VK6RK

As I write this at the end of October, December and Xmas seem a long way away and my upcoming trip to VK7 is still in the distant future. However time seems to fly by these days and the monthly task of assembling the input from the states groups comes around once again. Input has been a bit light on this month, probably because everyone has had such a hectic time with the Royal Show, JOTA, National Field Day and, of course, the peak of the contest season.

## PARG at the National Field Day.

Rex VK6SN reports:

*We set up in the rotunda on the Mandurah foreshore and caused quite a stir with our trailer and mast. It was perfect weather, wall to wall blue sky and 28 C temperature. We had a good response from the public with a lot of enquiries on obtaining a licence; luckily we had the Foundation handbooks available showing what was involved. More people showed interest when they found that morse was no longer part of the exam. We also had the WIA CQ brochures to hand out.*

*Our HF contacts included NZ, Spain and the US, plenty of 2 metre contacts and also worldwide contacts on ILRP and Echo link, with members of the public operating on all the bands.*

*If all the people who enquired about our club meetings turn up we will have to move into a larger building. Overall it was a very good and a lot of people suggested it became an annual event. 73 de Rex VK6 SN*

Sounds like it was a good turnout Rex; and the pictures are good too.

## HARG's National Field Day activities from Wireless Hill.

23 October saw the inaugural WIA National Field Day. The Hills Amateur Radio Group (HARG) set up at Wireless Hill park, in Perth's southern suburbs. The Hill is the site of one of Australia's first Morse stations, built 1912 to communicate with shipping. It now serves as a very popular picnic and BBQ location and it also hosts a telecommunications museum.



Members of PARG with the Mayor and SES.



HARG: Christie VK6XCJ in the background relaxing, Barry WD4MSM/VK6 on the microphone, Martin VK6ZMS logging. Photo by Bill VK6WJ.

HARG opted for a solar setup with Heath VK6TWO kindly donating his solar trailer consisting of a number of panels, regulators and a heavy duty battery. The sun stayed out all day so the battery voltage never dropped below 13 volts. With plenty of space and trees, several long-wire and dipole antennas were strung up. A nine metre squid pole with an SGC auto tuner and radials was also swung into action. HF conditions were not as good as was hoped for

but contacts were made. HARG had a few radios on display, including two Icom IC-7000s, a Yaesu FT-847 and an Icom ID-1.

A number of visitors to the park were curious about the contraptions in the sky and wandered over for a chat. One young visitor in particular was fascinated by the radio technology on display. The 'Calling CQ' brochures

**Continued on page 62**

# ALARA

*Margaret Blight VK3FMAB*

Publicity Officer

## YLS are out and about

Not only the flowers are blooming in our spring this year, and what a season it has been for a marvellous amount of colour, texture and perfume in our gardens. There have also been many occasions where amateur radio operators have been out of doors demonstrating their hobby to the wider public. With some success, I might add.

### A huge weekend of radio for the ladies of VK3

Every year the City of Box Hill runs a Spring Festival providing an opportunity for a large number of organizations and interest groups to set up their own individual marquee in which they may provide information about their group's activities and demonstrate some of their skills.

Many groups provide some form of community work or support. Most consist of volunteers. There is a multi-cultural element demonstrated too which helps make it such a colourful event.

Many hundreds of people attended, young and old, who walked around

the large area communicating with the various representatives of clubs and organizations and enjoying the free entertainment provided throughout the day.

The Eastern & Mountain District Radio Club set up their tent in their usual location and this year extended an invitation to female club members for ALARA to have its own table.

This opportunity enabled the ALARA table to be front and centre and hopefully catching the eye of all who passed by. The radio demonstrations and video projections were further inside the tent and many stopped by to view them.

A number of enquiries were made of the ALARA representatives, many of which were fielded by the State Representative Jean VK3VIP who put in a sterling performance for most of the day. A number of membership application forms were given out, so hopefully we will see some more members sign up.

The previous day saw Jean VK3VIP representing ALARA at Scienceworks Museum at an information stand

operated by Melbourne's Eastern and Mountain District Radio Club. She managed to introduce a few young people to amateur radio and was assisted by Emily VK3FEGL, who is pictured demonstrating amateur radio to Erin, the granddaughter of WIA president Michael Owen VK3KI. The girls were ably supported by Robert VK3DN, Lino VK3EI, Matthew VK3VIL and John VK3DQ.

### Best wishes for the season

The coming weeks will bring pressure and joys. May I wish you all a happy and peaceful time. So a seasonal bonus for you...The answer to a question many still ask! How did 33 originate as a sign off for YLs?

### The start of the YL 33

*Clara had her ticket  
She also had a rig  
Because she was just starting  
It wasn't very big.*

*She slowly tuned the crystal,  
And watched the meter drop.  
Then tapped the key a couple times  
To be sure it wouldn't stop.*

*Now everything was ready.  
She called a short CQ  
And received an answer  
On thirty-six sixty-two.*

*They chewed the fat 'bout stuff and things.  
'bout dresses, work and dates.  
They finally called it QRT  
The girl sent eighty-eights.*

*Clara thought it mighty funny  
Whether it be Miss. or Mrs.  
To end a perfect QSO  
By sending "Love and Kisses"*

*It sounds too sentimental;  
Just a little too much "goo"  
To be sending "Love and Kisses"  
To a girl the same as you.*

*For an entire week she pondered;  
Wouldn't even touch the rig.  
She pushed her slide rule by the hour,  
Employing "logs" and "trig".*

*She added and subtracted.  
What could the answer be?  
To reach a happy medium  
Twixt eighty-eight and seventy-three.*

*Clara finally looked up from her work  
All smiles and not forlorn.  
Twas July in Nineteen Forty  
That thirty-three was born.*

*There's no real definition  
But it's meaning is known well.  
It's how a YL says good evening  
To another friend YL.*

**By Clara W2RUF**



*Margaret VK3FMAB and Jean VK3VIP with Michelle VK3FEAT in the background at Box Hill.*





### At Scienceworks Museum

Above:

Matthew VK3VIL, Robert VK3DN, Emily VK3FEGL, Lino VK3EI, Jean VK3VIP and John VK3DQ.

At left:

Emily VK3FEGL demonstrating amateur radio to Erin.



### VK5 activities

On Saturday 23 October, like many other amateurs, some of the ALARA YLs were involved with stations participating in the WIA National Field Day.

Lesley VK5LOL and Christine VK5CTY were both part of the AHARS group. The station was set up at a Strawberry Fair at one of the Primary Schools in the Adelaide Hills. Eden Hills School has run this Fair for many years and they always have a very good roll-up. One of the members of AHARS, Patrick VK5FMPJ is a pupil at the school and suggested it as a venue for the Field Day Station.

At the same time, Meg VK5YG, as a member of the Lower Murray Amateur Radio Club, was at the local Bunnings store with a radio station which provided a great interest for a number of onlookers.

As Saturday seems a particularly busy time at any Bunnings store, this seems a very good location in which to set up a station.

## YLs contribute to the community in many ways – Christine VK5CTY

On Saturday 16 October, Meg VK5YG and Christine VK5CTY, along with several hundred others, attended a medal ceremony at Government House Adelaide. The special reason for Meg and Christine being present was to witness Jenny VK5FJAY being presented with a medal for 32 years of volunteer service with St John Ambulance Service. Her medal was presented by the Governor of South Australia.

We can only marvel at the level of commitment of many of our volunteers who freely give up their spare time to help the community. Congratulations Jenny "we take our hat off to you", 32 years is a wonderful record of service. Well done VK5FJAY!

The photo shows Jenny, resplendent in her St. John uniform, standing beside a rather special motor bike. This motor bike was ridden to emergencies in the very early days of St John Ambulance Service and has been lovingly restored by the son of the man who rode it. Jenny tells us that only the men rode the motor bikes in those days. The women wore



white dresses and nursing caps or veils, not very suitable on a motor

bike although they carried out the same duties as the men.

# VK7news

Justin Giles-Clark VK7TW

Email: vk7tw@wia.org.au

Regional Web Site: <http://reast.asn.au/>

## Tasmanian Radio; Ulverstone, The Domain, Myrtle Park — and the Milky Way

A quick reminder that by the time you receive this edition of AR we will be in full swing with the VK7 Central Highland Hamfest that happens every two years in the small central highlands town of Miena. This event is hosted by the Central Highlands Amateur Radio Club of Tasmania in the fantastic venue of the Miena community hall. Many of our regular traders are coming across to make this another memorable event. December 4 2010 from 10 am to 2 pm and you can purchase lunch at the venue.

A big Remembrance Day Contest congratulation goes to Martin VK7GN, Laurie VK7ZE and Wayne VK7FWAY. Martin topped the HF Single Open category with 798 points and was closely followed by Laurie VK7ZE with 772 points. Wayne was the only VK7 Foundation licensee entrant and came fifth in the VK list for the HF Single Operator category with 574 points – a fantastic effort!

A reminder that you only have until 30 January 2011 to claim your WIA Centenary Certificate and there are many VK7 who have enough contacts and points to claim their award.

### Cradle Coast Amateur Radio Club

The National Field Day saw a great VK7 public activation from CCARC at "Otto's Grotto" in the WWI Naval Memorial - HMAS Shropshire Park in Ulverstone. There was HF and VHF active along with a BBQ and a great time was had by all. Thanks to Wayne VK7FWAY, Keith VK7KW, Scott VK7FTTT, Mike VK7MH, Dick VK7FORF, Steven VK7FXXX, Steve VK7ZSJ and the club's newest member, Steven Terris.

### North West Tasmanian Amateur TeleVision Group

JOTA was alive and well in NW VK7 with NWTATVG providing assistance and equipment for three Scout camps on October 16. The camps covered were Paton Park in Ulverstone, Camp Boomerang at Port Sorell and Burnie Scouts. A big thank you goes to Bob VK7MGW, Ursula VK7FROO, Graham

VK7FGAA, Lucas VK7FLSB, Ross VK7WPF, Neil VK7ZNX, Jim VK7JH and Tony VK7AX who supplied time and equipment.

After approximately 35 years of operation, Tony VK7AX has closed the Packet Radio BBS known by the SSID of VK7AX-6. Over time RF users have decreased and running costs have increased and the decision was taken to close the BBS. Tony thanks the many amateurs who have provided support to this service over the years.

### Radio and Electronics Association of Southern Tasmania

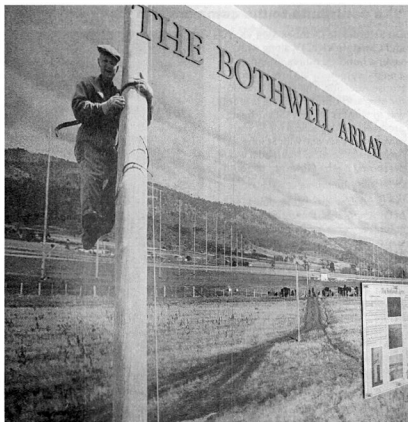
We have started transmitting DVB-T on 446.5 MHz from the Queen's Domain Studios on a Wednesday night from around 7:30 pm. If you have a set top box that can frequency tune to 446.5 MHz and a high gain antenna pointed toward the Domain

then we would love to hear a signal report of signal intensity, signal quality, your location and antenna. The callsign used is VK7OTC and we have had some great reports so far.

October 16 saw about 40 people from around VK7 and about 10 kids visit the Grote Reber Museum at the Mt Pleasant Radio Observatory at Cambridge.

The museum has many wonderful artefacts and information about amateur radio operator Grote Reber (SK) and his experiments mapping the Milky Way using HF from his square kilometre array about five miles north of Bothwell.

We toured the museum, the 26 m radio astronomy dish, looked at sun spots through a solar telescope and finished off with 3D movies in the 3D Virtual Reality Cinema.



Grote Reber (SK) at his Bothwell antenna array.

A great time was had by all who attended. A big thank you to Karen Bradford and Dr Stefan Deiter, the curator of the museum and Phil Watkins who all made this visit a memorable one.

The November presentation to REAST was given by David Hay and David Long from the Field Operations Section of the ACMA. They covered the management of complaints,

HF monitoring at the Quoin Ridge facility, compliance activities, supporting major events like the grand prix, conducting technical investigations and the Digital Switch-Over field surveys along with some interesting experiences and anecdotes. A big thank you to Dave Hay and Dave Long for their time and presentation and providing an insight into the activities ACMA undertake.



David Long and David Hay from the ACMA Field Operations Section.

## Northern Tasmania Amateur Radio Club

NTARC lets us know of the recently upgraded 6 (50.057 MHz) and 2 (144.474 MHz) metre beacons at Don Heads (VK7RAE) which are now locked to a highly stable GPS disciplined clock.

A big thank you to Joe VK7JG for construction and installation, Rex VK7MO for the GPS receiver, Peter VK7PL for the Philips chassis and power amps and David VK3HZ for making the GPS locked excisers.

The October meeting saw Tony VK7YBG demonstrating his Ukrainian RigExpert antenna

analysing hardware and software. The audience came forward with a few examples including a dual band whip, UHF/VHF/GPS and 3G antenna combinations, half-wave 2 m vertical dipole, and 2 m/70 cm Yagis.

The analyser did a great job of showing the RF characteristics of each of these antennas. A reminder that the December NTARC meeting occurs again at Myrtle Park on December 8 and of course we are looking for the first to catch a fish and receive the slippery trout award!

ar

## SilentKey

It is with a very sad heart that we report that VK7AJ Lin Williams passed away peacefully in his sleep on 25 October.

Lin was passionate about two things: his radio hobbies including amateur radio and motor bike racing. Lin was involved in all aspects of wireless communication in Northern Tasmania and raced on many of the tracks around Tasmania.

## Lin Williams VK7AJ

Lin always held a wonderfully balanced view on all aspects of life, had a tenacious never-give-up attitude that was truly humbling to all who met him, and his thoughtful on-air nature will be missed by those who knew him.

Our thoughts and condolences go out to XYL Jean.

Rest in peace, old friend.

Jason VK7ZJA

## SilentKey

### George Thomas Bruce VK2GT

It is with sadness that we advise the passing of George Thomas Bruce VK2GT. George passed away peacefully on Sunday morning (17/10/2010) at Carrington Centennial Care after a short illness. George was first licensed in 1932 at the age of 17 and held that licence until his death at 96 years, just two weeks short of his 70th wedding anniversary. He attained his licence at the same time as his neighbour and lifelong friend Ross Weeden VK2PN (SK) of Tumut. He was very pleased when his son Lloyd attained his licence in 1981 and his grandson Lachlan VK2LGB also gained his licence, making three generations. He was a member of the Mid South Coast Amateur Radio Club for many years, until poor health made it impossible for him to get to the meetings. George was also very involved with the early years of the WIA transmitting station at Dural and worked for the Department of Civil Aviation for most of his working life. He will be sadly missed by all who knew him.

Submitted by his son Lloyd VK2ELB.

#### Silent key

A silent key we mark today  
It's VK2GT

While active on the airwaves past  
No Morse Code will there be  
The valves and aerials no more  
Will find a contact free  
The skeds and shacks and home made gear  
Beside that cup of tea.  
Repeaters will no longer buzz  
With friends across the sea  
No broadcasts Sunday morning  
And dials tuned constantly.  
For almost 80 years there's been  
A voice both strong and free  
But now it's time to say goodbye  
To another silent key.

By Terry Bruce



The ham radio boys, Lloyd, Lachlan and George.

# VHF/UHF An Expanding World

David Smith VK3HZ  
vk3hz@wia.org.au

## Weak Signal

David Smith VK3HZ

No sooner had I pressed "Send" to dispatch last month's report to our trusty Editor than the bands opened and the first VK to ZL 2 m tropo contacts occurred.

On the evening of October 12<sup>th</sup>, the Hepburn tropo forecast was showing a stripe of enhancement from the VK2/4 border southeast to the northern tip of the South Island of New Zealand. Bob ZL3TY reported hearing the Newcastle Ch 5A TV at 5x5 and rising (this "beacon" will be a big loss when they shut down analogue TV). At 0945, on 2 m, he worked Adrian VK4OX (5x1) and Grant VK2MAX (5x4). By 1005, signals had risen to S9 and he worked Steve VK2ZT (5x2), John VK4TJ (339) and Roland VK4VDX (519). The VK2RSY 2 m beacon rose to 5x1. Unfortunately, the opening did not extend far enough south for Norm VK3DUT.

The next morning, the band was still open, and there was a repeat of the contacts of the previous evening. Joining them were Ross VK2DVZ (5x4), Ron VK4CRO (5x4), Ron VK4DD (5x5),

John VK4MJF (5x4) and Mick VK4NE (5x4). The opening continued on-and-off for the whole day, seeming to favour VK4 more as it went on.

The following morning (October 13<sup>th</sup>), remnants of the opening were still present with the last contact between Bob and Adrian VK4OX (559) at 2000Z before the band finally closed.

### VK9NA Team EME Tests

Alan VK3XPD reports on some recent activities in preparation for their DXpedition:

*For our forthcoming VK9NA DX Expedition in January 2011, our primary focus is on the microwave bands from 1296 MHz through to 10 GHz. However, due to the unpredictable and fickle nature of the tropo as it applies to microwave propagation, we had also considered expanding our horizons to include 2 metres EME.*

*Rex Moncur VK7MO kindly offered us a suitable homebrew portable Yagi for the purpose. It is a rather large antenna with 19 elements and a full 6 wavelengths (12 metres) long.*

*With the ARRL EME Contest on Sat-Sun 30-31 October, Michael VK3KH suggested we set up a "portable"*

*station to determine if 2 metres EME was possible with this single Yagi combined with the RF gear we were taking.*

*As most of you will no doubt be aware, the logistics in managing such a long Yagi can be quite challenging, especially in windy weather. To get an idea of the task involved, prior to the contest we laid out Rex's comprehensive "kit of parts" on some flat ground at Michael's QTH in Mt Eliza in order to work out how it all went together.*

*Finally, after an hour or so, we had the basis of one very long Yagi. Due to its physical size and the fact that it was originally designed to be light and transportable (via aircraft) for portable use, there are multiple longitudinal and lateral bracing ties to maintain the overall rigidity.*

*Our operating window for the contest commenced Sunday at 0200 AEDST for moonrise with the Moon setting about 12 hours later at 1400 AEDST.*

*To allow us some level of comfort, we decided we should try to setup the antenna on the roof of Michael's business premises and operate from his first floor office in Cranbourne.*

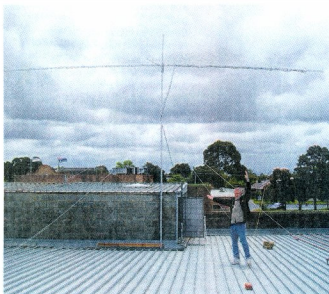


Photo 1: Michael VK3KH tames the long Yagi.

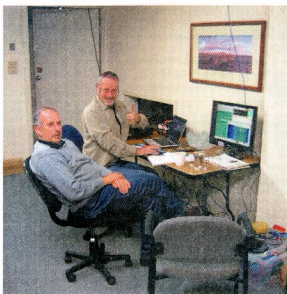


Photo 2: Colin VK5DK and Mike VK3KH working EME.

Driving down to Cranbourne with Colin VK5DK in tow on Sunday morning, it was pouring rain with a very heavy sky. We met Michael at 0100 AEDST (yes, 1 am) and set the laptop up in his office with a connection to a large video monitor.

We then initiated sessions for WSJT7 (JT65B) and a link to the Weak Signal Bulletin Board - NOUK - that gave us information on who was EME-active at any given time.

At 0220 AEDST we had moonrise from the North East (USA) and to our great delight the first QSO we achieved was with Joe Taylor K1JT, the designer of the WSJT weak signal package we were using, and the main mode on EME worldwide.

With the rain continuing and the moon not visible, we quickly worked four more USA stations, and one JA station. Then nothing for the next two hours.

As the moon climbed up to its apogee of +38 degrees, we tracked it with fairly regular manual AZ/EL adjustments at intervals of about 30 minutes. Along the way we had several very bad periods of rain static which swamped the receiver front end with very high noise levels preventing any EME ops.

The USA window closed and the EU window progressively opened around dawn. Colin had gone home and Peter VK3TPR visited us for a few hours.

What a nice surprise it was when we worked Guy VK2KU with an impressive -20 dB signal. Guy had heard us from Norfolk Island in January 2010 but we were unable to complete.

Over the next six hours, with a few more rain static interruptions, we worked many more stations, and had a few "misses" until the moon finally set in the north west at 1400 hours.

Our final tally for the 12 hours was 22 stations, for 12 countries.

We had clearly proven that our setup was "very" EME capable! So we are taking it to Norfolk Island in January, 2011.

We are looking forward to a busy schedule of microwave ops and 2 metres EME during the middle two weeks of January 2011.

Cheers from the VK9NA Team of Michael, Kevin, Andrew and Alan.

See also page 59

## 10 GHz home operations

There are a number of stations now capable of operating on 10 GHz from their home QTH at virtually no notice, which opens up new possibilities. Alan VK3XPD writes:

*I am hoping to inspire a bit of interest in 10 GHz operation via Aircraft Enhancement from those of you in Adelaide, Canberra and maybe Tasmania.*

*From this QTH here in Camberwell, my 10 GHz Home station up about 10 metres has an excellent "shotline" for the MANY aircraft going to/from*

*Adelaide, to/from Canberra/Sydney and down south to Tasmania. Anyone with 10 GHz gear in this line, or even slightly off to the sides, will benefit from this enhancement.*

*To give you an idea of what is possible, even in the middle of winter, Colin VK5DK in Mt Gambier some 375 km away to my west is workable using WSJT on troppo on most bad weather days. Aircraft Enhancement gives us many dB of additional lift over 2-3 minutes duration.*

continued next page

## The Magic Band - 6 m DX

Brian Cleland VK5BC

October was another disappointing month for 6 m. Very little reported in VK except odd TV carriers in the 40 MHz range from the north, mainly China.

More activity though in the Philippines where Willem DU7/PA0HIP reports the following:

October was relatively good, propagation-wise, with several very good F2 openings to JA in the late afternoon and early evening. Nearly every day there was propagation in the direction of JA, UA0 (inband TV) and BY in the 3000 to 4000+ km range, sometimes for only minutes, but on many days also extended to hours. A big problem in this part of the world though is activity, on most days it was low or non-existent.

Good days to JA/BY were October 1, 3, 6, 8, 9, 10, 15, 17, 18, 19, 20, 22, 23, 30. On October 17, I even worked a JA2 with 50 mW in a whip antenna, his RST 599 on a slow s-meter, hi. On a couple of days I was working them on a 40 m dipole, because of the damage to my 2 x 7 array. All JA districts were worked, with many JA8s (4000+ km) and also BY4, 7, 8, 9 districts and the occasional HL.

Night time TEP (Spread F) happened on several days of the month, especially in the beginning of the month, with Mark VK8MS worked on many occasions with S9+ signals, but no other activity unfortunately. The VK6RSX beacon was heard weakly on several occasions and so was the YF100/B beacon, which peaked S99 at times (but same story about activity). An especially good day for Spread F was October 1st with propagation to VK4, VK8 (MS)

and VK6 (RSX). The VK4s TL, ABW, FNQ, and ZFC (new grid loc for me) were worked with signals up to an incredible S9+25 dB, with the characteristic flutter QSB.

On the 15th October Brian VK4EK in Sapphire reported working JA2DDN.

Good opening to JA on the 6th November from the Harvey Bay area when Glen VK4BG and Harvey VK4AHW worked JG1TSG. Glen also worked JA1NPD, JK1OXU and JE1BJT.

Another good opening from northern VK4 to JA and DU7 on 11 November. Opening extended from John VK4TL in Cairns area, south to Brian VK4EK in Sapphire and Ray VK4BLK in Yeppoon. Several JAs were worked along with Willem DU7/PA0HIP.

From the Es perspective there was nothing reported during October. Early November saw a few contacts reported, 5 November Brian VK4EK worked Rob VK3XQ, 6 November Gary VK4ABW worked Brian VK5BC and on 11 November Joe VK8VTX in Darwin reported the Townsville beacon and worked John VK4FNQ in Charters Towers. Hopefully the Es really come to life later in November.

Hope everyone has a very safe and Merry Xmas and Happy New Year. Maybe the sun will start showing more signs of activity in 2011.

Please send any 6 m information to Brian VK5BC at [biancleland@bigpond.com](mailto:biancleland@bigpond.com)

Unfortunately for Colin and I, we do not have many flights on this east-west path. We only get lift from some of the Perth flights and a few other irregular services.

However, when we do get good lift, we often hear our tones and some of the Doppler trails are absolutely stunning to see on screen.

### VK7MO to VK3PY on 10GHz

Chas VK3PY writes about a recent long-distance 10 GHz QSO:

Following an exchange of emails on 20 October with Rex VK7MO who was about to come over to the mainland for some extensive 10 GHz portable operations, Rex indicated he would be available for a quick test from Devonport prior to boarding the ferry. We arranged a sked for the next day (Thursday, October 21), in the late afternoon. The distance between our respective locations would be about 380 km, albeit pretty much over water.

For my location I chose a hilltop about 15 km west of Geelong at an elevation of 210 m ASL with a clear view to Bass Strait about 20 km away. The weather was calm and sunny, the temperature around 25°C.

I arrived on site at 4:00 pm (local EDT) and was set up within 15 minutes. On switching on my 10 GHz transverter I immediately found a JT65 signal (possibly from Michael VK3KH or Alan VK3XPD, both of whom were hoping to work Rex).

Shortly after this, Rex phoned to advise he too was set up and ready to transmit. As soon as he keyed his transmitter I copied his carrier and peaked my dish on it. Imagine my elation at hearing it S9!

We went to SSB and exchanged signal reports. I gave Rex 59 and received 57 in reply, with some deep QSB at times. Nevertheless the contact was "armchair copy" all the way. By this time Ken VK3NW had joined me on the hill.

Since Rex was on a tight schedule there was no point in Ken setting up a separate system (pretty much identical to mine, as it happens) so he just picked up the microphone and made an easy contact too.

For the record, my 10 GHz station consists of a converted MITEC data link driving a 3 W DEMI PA and a 600 mm circular dish. Rex uses a DB6NT transverter with a 10 W PA to a 640 mm offset-fed dish.

Several of us also recently worked Rex VK7MO across Bass Strait when he was visiting northern Tasmania.

David VK3HZ has 10 GHz operational at home by appointment.

Russell VK3ZQB in Port Fairy is also QRV and Michael VK3KH will

hopefully be QRV by appointment from his upstairs balcony (to the west only) very soon.

So how about it? Is anyone keen to try 10 GHz Home station ops? It's a whole lot of fun and it puts your microwave gear to good use between contests!

### VK3NX 47 GHz Gear

Following on from last month's report, Charlie VK3NX submitted some photos of the gear used by him for the record-breaking contacts with David VK3QM.

That's it for another year. Best wishes to all for the season. Here's hoping for a bumper summer of DX on the bands and in the modes that you most prefer!

Please send any Weak Signal reports to David VK3HZ at [vk3hz@wia.org.au](mailto:vk3hz@wia.org.au).



VK3NX 47 GHz transverter



View from the operating location.



VK3NX 47 GHz horn antenna.



# Digital DX Modes

Rex Moncur VK7MO

This month's column focuses on 10 GHz terrestrial operations using the digital mode JT65C. The key to long distance tropo-scatter operation where signals may be too weak to hear is to reduce the number of variables that arise from the six basic ones of frequency errors at both ends, azimuth errors at both ends and elevation errors at both ends:

Accurate frequencies at both ends avoid the need to search for a weak signal, which may only occasionally rise above the -28 dB threshold of WSJT. This is generally achieved by locking to a 10 MHz GPS or rubidium reference and typically results in frequency errors of less than 10 Hz at 10 GHz. Short-term frequency stability is also important requiring a good quality single or double oven OCOXO and a drift of less than 10 Hz over a minute.

Accurate alignment of antennas is required in both azimuth and elevation at both stations. With a typical 60 cm portable dish, the 3 dB beamwidth is around 3 degrees, so a 1.5 degree error in either azimuth or elevation at either station puts you 3 dB down.

Desirably one would seek less than one dB loss which requires both stations to be aligned to better than half a degree. The most accurate technique we have found for alignment is to use a rifle scope (readily available at gun shops for less than \$100) that has been set to the same direction as the antenna beam based on sun or, better still, moon noise.

Sun noise should be around 3 dB for a 60 cm dish and moon noise around 0.05 dB. While sun noise is easier to detect, the difficulty is that one cannot look directly through the rifle scope at the sun and one needs to put thin paper, marked with a cross, across the scope to form an image. If moon noise can be detected, this can be more accurate as one can align the rifle scope graticule directly on the moon.

The best way to measure moon or sun noise is to use a wide bandwidth detector at the IF. Once the rifle scope

is aligned one can align directly on the station in azimuth by using some feature such as a farm house that one can see on Google Earth or alternately use some marker such as a flag, the position of which has been established by GPS over a distance of at least 500 metres to achieve the required 0.5 degree accuracy.

Elevation can be set by aligning the rifle scope on or just above the horizon. The spreadsheet at the following URL is useful for alignment

on objects that are not directly on the path if your system includes a protractor or other means of accurately measuring relative angles:

[http://reast.asn.au/2010/Great\\_Circle\\_Bearing.xls](http://reast.asn.au/2010/Great_Circle_Bearing.xls)

## 10 GHz Rain-scatter

### See Figure 1

Colin VKSDK has provided an interesting image of the results of rainscatter on 10 GHz signals from Russell VK3ZQB as shown in Figure 1.

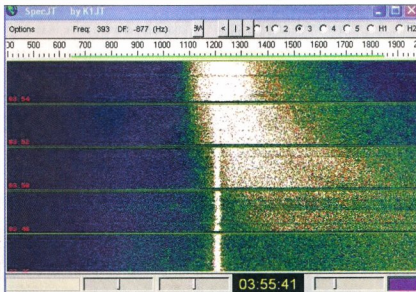


Figure 1: VK3ZQB 10 GHz rainscatter signals.



Figure 2: From left, Peter VK3TPR, Rex VK7MO and David VK3HZ's dish.



The image covers a period of approximately 10 minutes during which Colin was receiving Russell's signal as an approximately 1200 Hz tone on alternate periods. At the bottom of the image the 1200 Hz tone is clearly visible due to troposcatter.

As one moves up from the bottom a second widely spread rain-scatter signal appears spread from around 1400 to 1800 Hz which gradually falls in frequency and spread to completely cover the troposcatter signal. This image was generated using the waterfall display called SpecJT included in WSJT7.

## 10 GHz Comparison Tests from Mt Dandenong

See Figure 2 previous page

Figure 2 shows 10 GHz portable stations on Mt Dandenong with Peter VK3TPR on the left, Rex VK7MO in the centre and David VK3HZ's station on the right.

Comparison tests were made with Colin VK5DK over a 402 km path that demonstrated that VK3HZ's station was about 2 dB down on VK7MO's, consistent with sun noise measurements which gave 1.8 dB on the VK3HZ station (60 cm dish) and

3.5 dB on the VK7MO station (64 cm dish).

Peter VK3TPR's station was newly completed without a pre-amp and while he was unable to copy VK5DK, he did copy VK3ZQB demonstrating that he is well on the way.

## 10 GHz Grid Square tour around Tasmania

During October Rex VK7MO operated portable from six grid squares mainly in Northern Tasmania working back to VK3 with contacts as shown on Figure 3. The longest contact was 585 km from Mt Wellington in Southern Tasmania to Alan VK3XPD at -22 dB. Russell VK3ZQB worked into East Devonport over 480 km.

David VK3HZ worked five northern grid squares on both JT65c and SSB from John's Hill Lookout in the Dandenongs and Chas VK3PY at Bayview, west of Geelong, worked into East Devonport on SSB. Michael VK3KH went portable to Berwick with a newly completed station and was pleased to work into East Devonport for his second ever 10 GHz contact to VK7 at -17/-22 dB on JT65c.

## 10 GHz Grid Square Tour

Rex VK7MO undertook a tour some 300 to 600 km from Melbourne to grid squares not worked earlier this year. A total of 13 new grid squares was worked back to Melbourne to Dave VK3HZ and Alan VK3XPD using mainly digital modes JT65c and ISCAT. Other stations participating were Peter VK3TPR, Russell VK3ZQB, Colin VK5DK, Chas VK3PY, Dave VK3QM and Ian VK5ZD. A full report of the Tour is at the following URL:

[www.vk3hz.net/microwave/VK7MO\\_Gridsquare\\_Tour.pdf](http://www.vk3hz.net/microwave/VK7MO_Gridsquare_Tour.pdf)

Key achievements of the tour were as follows:

Best aircraft scatter completed 650 km VK3HZ Mt Dandenong to Port Elliott lookout in South Australia using JT65c for a new Australian digital record

Best aircraft scatter on ISCAT VK3XPD to near Goulburn NSW at 567 km.

Best troposcatter completed 439 km VK3XPD to Green Cape on JT65c.

Best SSB troposcatter VK3HZ Mt Dandenong to near Hay NSW at 322 km.

While JT65c generally worked well on aircraft-scatter it failed to decode if the Doppler variation was more than about 100 Hz over a TX period representing the aircraft crossing the path at more than about 15 degrees.

In such cases the new WSJT9 mode ISCAT copes better with Doppler and short bursts of aircraft-scatter and proved to be superior even though its sensitivity is about 10 dB worse than JT65c.

It can also be used with 15 second TX/RX periods, a quarter of JT65c, giving a much better chance of completing a QSO during a single aircraft crossing.

Some initial results on using aircraft side scatter where the aircraft does not cross the path were noted and require further investigation.

Please send any Digital DX Modes reports to Rex VK7MO at [rmoncur@bigpond.net.au](mailto:rmoncur@bigpond.net.au) **af**

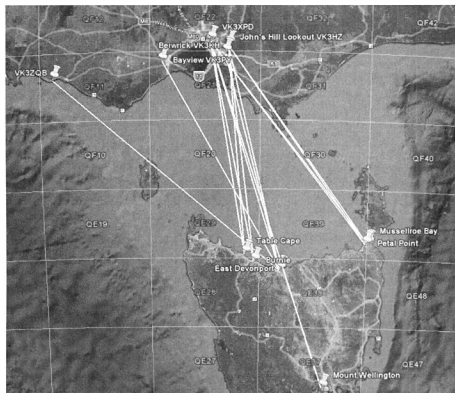


Figure 3: Recent VK7MO 10 GHz activity.

# VK9NA 2011

## Get your gear ready for mid January

Following a successful season last January, the VK9NA team of Alan, Kevin and Michael will be joined by Andrew VK1DA, for a return to Norfolk Island in January 2011.

We will be operating from about the 8th of January through to about the 20th which includes the Summer VHF/UHF Field Day weekend in Australia. Here is an opportunity for those who missed adding VK9NA to their log!

With the VHF-UHF Field Day falling in the middle weekend of this DXpedition, this will give many more the chance to get into a great location to work Norfolk Island. Get your gear ready!

This year the team will have a particular focus on the Microwave bands from 2.4 GHz to 10 GHz, as

we have unfinished business in this part of the spectrum. This does not mean the lower VHF bands will be neglected, as we will be operational on all bands from 50 MHz to 10 GHz. Modes operated will include SSB, CW, FSK441 and JT65.

Also, after successful tests, we are pleased to announce: VK9NA will be on 2 metre EME this year.

We have added a 12 metre long Yagi (courtesy of Rex VK7MO), and look forward to extending participation to VHF stations around the world.

Accommodation and airfares are

# VK9NA 2011



**NORFOLK ISLAND**  
**SOUTH PACIFIC**

booked, and planning is advanced.

This year we should have 240 volts. This, along with an expanded team, will mean there will be more bands operational at more times.

Do not miss out this year!

For updates and schedules, keep your eye on: <http://www.vk9na.com>

*The VK9NA team*

## VK4news

## JOTA in Far North Queensland

*Mike Patterson VK4MIK*

The Tableland Radio Group operated its third JOTA station on the Atherton Tablelands again this year.

After last year we 'de-briefed' the event with a view to improving 2010. Co-ordinator, Pat VK4MUJ, did a great job in this department.

Just prior to this year's event, we contacted local Scout Leader Peta, who facilitated all that was necessary between her organization and TRG.

National JOTA coordinator Bob Bristow VK6POP gave invaluable advice about registering for the event and on numerous other issues.

The format for our pre JOTA information training sessions ensured Scouts and Guides were taught about radio history, what we were planning, personal safety while operating around radio transceivers, masts, antennas and cabling. The sessions over a three week period were interactive with practical CW sessions and were "icebreaker".

Immediately prior we settled on equipment and back up, to allow for the inevitable "Murphy Effect".

Bill VK4WL took charge of the digital side with transceiver, power supply, computer and a specially designed squid pole light weight antenna with

inverted Vee and open wire feed.

SSB and CW was catered for by Mike VK4MIK with responsibility for two HF/VHF/UHF rigs, tuner, BHI DSP speaker, PSUs and bits and pieces.

Wilf VK4ZNZ had designed the CW trainer with 30 metres between.

Ross VK4AQ produced the logs and a comic book design on radio.

Pat VK4MUJ and Dave VK4FUY did some watching/reading and quality assurance and clarifying of proposals.

Stan VK4MFA and Keith VK4BKS volunteered to be operators.

On Friday the inverted Vees were set up with Scout assistance and the tri-element beam and rotator tested again. The workstations were set up.

We went to air about 1715 on the Friday and had local/national and overseas contacts with good openings to Norway/Finland/Poland.

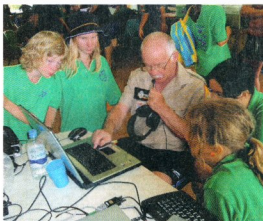
On Saturday we started at 0600 as the youngsters were keen. No microphone fight in these youngsters!

Pat VK4MUJ/Dave VK4FUY,

Stan VK4MFA, Wilf VK4ZNZ, Terry VK4ATY and Keith VK4BKS gave the full time crew a break.

The groups set up tents behind the Malanda Scout/Guides Huts; quite a community with over a hundred children under canvas. Groups took walks with leaders while more senior members, including Venturers, did other planned exercises

All operators were presented with JOTA/JOTI badges at the final parade and thanked for their involvement in the event. We will do it again in 2011. **ar**



*Wilf VK4ZNZ demonstrates JOTI.*

## More on Doppler

In the July-August 2010 issue of The AMSAT Journal, AMSAT-NA Secretary Alan Biddle WA4SCA presented an article on updating the "One True Rule" of computer Doppler tracking. This month we look at an example of Doppler shift and how Alan's ideas can be used.

### Doppler example

For those who are not used to operating through a linear transponder here is a description of the Doppler shift of a typical satellite pass. The satellite is VO-52 (HAMSA) and the pass happened on the evening of 4/11/2010 (orbit number 29747). It was travelling from south to north over the Tasman Sea. Table 1 is a summary of the times of Acquisition Of Signal (AOS), Time of Closest Approach (TCA), Loss Of Signal (LOS), maximum elevation and total Doppler shift (in kHz) of VO-52's 145.900 MHz downlink (middle of transponder passband). Three locations were chosen to give full usage of the pass in our part of the world. All times are in UTC.

Location	Hobart	Sydney	Cairns
AOS (UTC)	10:37	10:39	10:44
TCA (UTC)	10:43	10:45	10:50
LOS (UTC)	10:49	10:52	10:57
Max. Elevation	29.1	50.2	39.7
Doppler +/- kHz	3.10	3.28	3.23

Table 1.

There was a mutual window for all three stations between 10:44 and 10:49. Table 2 gives the elevation angle and Doppler shift near the start, middle and end of this five minute period when all three stations could contact each other. During the mutual window the Hobart station will experience a change in Doppler shift of ~2 kHz as the satellite moves down towards the northern horizon. The Sydney station has to cope with a change of almost 5 kHz as the satellite rapidly moves overhead. The Cairns station only has to allow for 700 Hz of Doppler shift during this period. Also for a given time each of the receivers will be tuned to a different frequency. At 10:44 the Hobart station will listen to 145.8990 MHz, Sydney to 145.9021 MHz and Cairns to 145.9032 MHz.

All the above means that at any point in time (apart from exceptional circumstances), all stations will be experiencing different Doppler shifts, different rates of change in Doppler shift and if they just stuck to the same frequency throughout the pass then few contacts would happen.

	Hobart		Sydney		Cairns	
Time	Elevation	Doppler	Elevation	Doppler	Elevation	Doppler
10:44	27.3	-1.02	35.5	+2.13	1.1	+3.23
10:46	15.8	-2.49	47.4	-0.96	9.6	+3.08
10:48	5.9	-2.99	23.2	-2.80	23.0	+2.51
$\Delta$ Dop (kHz)		1.97		4.93		0.72

Table 2. Mutual window.

That was just for the 145.9 MHz downlink. VO-52's transponder has a receiver centred on 435.250 MHz which makes the ground station's uplink Doppler shift three times larger (Doppler shift is proportional to frequency). So the Sydney station's transmitter would have to shift almost 15 kHz in five minutes. If VO-52 used a 1268 MHz receiver then the Doppler shift would be about 42 kHz for the uplink. Also if VO-52 had a 2.4 GHz transmitter the Doppler shift would be 16.4 times the 2 m downlink (81 kHz). That is a fair bit to keep up with in the space of five minutes. So how do stations keep on frequency?

### One True Rule

In 1994 Paul Williamson KB5MU wrote "The One True Rule for Doppler Tuning" [2]. The key paragraph is this:

"There is a simple rule that works. Well, it is simple to state, but not simple to use. The One True Rule: tune both the transmitter and the receiver to achieve a constant frequency at the satellite. If everybody did this, there would be no problem with everybody staying together on the same frequency, and there would be no drift through the passband. Nobody would drift off the end of the transponder. Unfortunately, the only way to perform this kind of tuning is by computer control. The computer can use the same Keplerian orbit model that predicts where to point the antennas to predict the Doppler shift for his/her location. The computer can then make continuous small adjustments to both the transmit frequency and the receive frequency, to compensate for the predicted Doppler."

Someone must have taken note of this because modern computer satellite tracking and tuning software can make the calculations and tune the radios.

### Alan's question

"With full implementation of the One True Rule, we have largely taken the busy work out of satellite communications. There is one question we have not made it easy to answer yet: 'What frequency are we on?' [1]. Alan also provides the answer: "However, in the case of full Doppler tracking, every station will be listening to the same frequency at the satellite. No matter how many are in the QSO, this will be an invariant all operators can agree upon." [1]

Alan points out that tracking programs usually display the frequency at the radio and some also display the amount of Doppler shift correction but none display the frequency at the satellite. Alan suggests, "The primary tuning reference would move by necessity to the computer screen rather than the rig. One could tune the rig dial, but watch the

'Spacecraft frequency' on the screen, or presumably enter it manually. With the steady progress toward software defined radios, or at least control software, this will soon seem natural, and already is for many" [1]. This method is ideal for scheduled contacts where you can just go straight to the frequency at the satellite without having to hunt around or mentally add the Doppler shift to the scheduled frequency. This would also be very useful with DX stations with short mutual windows. If you only have 30 seconds to make a QSO then you don't want to waste time tuning around when you can go straight to the same frequency at the satellite the other station is listening to.

One final quote from Alan, "If this option is added into existing and future programs, it will become a true 'HF mode' in terms of simplicity". How convenient it would be when you have just walked into the shack and turned everything on to find the satellite pass has already started (instead of just finished if Murphy had his way) then going straight to the scheduled frequency?

## References

[1] Biddle, Alan "Bringing The One True Rule of Doppler Tuning into the 21<sup>st</sup> Century (Or, 'What frequency is the DX on?!')". The AMSAT Journal July/August 2010

[2] [http://www.amsat.org/amsat/features/one\\_true\\_rule.html](http://www.amsat.org/amsat/features/one_true_rule.html)

## Final Pass

It all looked so easy four months ago when I started building the new shack. As I type it is still not completely finished but should be ready by summer. I wish you all the best of the holiday season and look forward to more satellite enjoyment in 2011.

ar

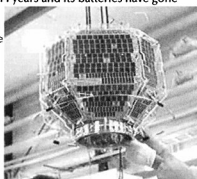
## FO-29 silent

FO-29's transponder was turned off by the JARL command station on 14 October. Power levels were low despite good illumination.

Since then, attempts have been made to turn the transmitter on, but without success. The JARL believes the satellite's high internal temperature is affecting its ability to receive commands. A long eclipse period started at the beginning of November so this will lower the temperatures and hopefully FO-29 will respond.

Unfortunately this also brings less illumination and FO-29 was unusable during the darker times of the last eclipse period in 2009. The peak of the next eclipse period is expected during mid 2012. FO-29 has been in space for over 14 years and its batteries have gone through tens of thousands of charge / discharge cycles, so it remains to be seen how much more life we will have out of this bird.

Mineo Wakita  
JE9PEL has posted an article about FO-29's illumination for the next few years on his website at <http://www.ne.jp/asahi/hamradio/je9pel/fo29illum.htm>



## In Tasmania

VK7RTV Gawler 6 m. Repeater 53.775 MHz  
IRLP node 6124  
VK7RTV Gawler 2 m. Repeater 146.775 MHz  
IRLP node 6616

## In the Northern Territory

VK8MA Katherine 146.700 MHz FM  
Operators may join the net via the above repeaters or by connecting to EchoLink on either the AMSAT-NA or VK3JED conferences. The net is also available via IRLP reflector number 9558. We are keen to have the net carried by other EchoLink or IRLP enabled repeaters and links in order to improve coverage. If you are interested in carrying our net on your system, please contact Paul via email. Frequencies and nodes can change without much notice. Details are put on the AMSAT-VK group site.

## Become involved

Amateur satellite operating is one of the most interesting and rewarding modes in our hobby. The birds are relatively easy to access and require very little hardware investment to get started. You can gain access to the FM 'repeaters in the sky' with just a dual band handheld operating on 2 m and 70 cm. These easy-to-use and popular FM satellites will give hams national communications and handheld access into New Zealand at various times through the day and night.

Should you wish to join AMSAT-VK, details are available on the web site or sign-up at our group site as above. Membership is free and you will be made very welcome.



**AMSAT-VK**  
**AMSAT Co-ordinator**

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## Group Moderator

Judy Williams VK2JUJ  
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**Website**  
**[www.amsat-vk.org](http://www.amsat-vk.org)**

**Group site:**  
**[group.amsat-vk.org](http://group.amsat-vk.org)**

## About AMSAT-VK

AMSAT-VK is a group of Australian amateur radio operators who share a common interest in building, launching and communicating with each other through non-commercial Amateur Radio satellites. Many of our members also have an interest in other space based communications, including listening to and communicating with the International Space

Station, Earth-Moon-Earth (EME), monitoring weather (WX) satellites and other spacecraft.

AMSAT-VK is the primary point of contact for those interested in becoming involved in amateur radio satellite operations. If you are interested in learning more about satellite operations or just wish to become a member of AMSAT-Australia, please see our website.

## AMSAT-VK monthly net

**Australian National Satellite net**  
The net takes place on the second Tuesday of each month at 8.30 pm eastern time, that is 0930 Z or 1030 Z depending on daylight saving. The AMSAT-VK net has been running for many years with the aim of allowing amateur radio operators who are operating or have an interest in working in the satellite mode, to make contact with others in order to share their experiences and to catch up on pertinent news. The format also facilitates other aspects like making 'skeds' and for a general 'off-bird' chat. In addition to the EchoLink conference, the net will also be available via RF on the following repeaters and links.

### In New South Wales

VK2RMP Maddens Plains repeater: 146.850 MHz  
VK2RIS Saddleback repeater: 146.975 MHz  
VK2RBT Mt Boyne Repeater on 146.675 MHz

### In Queensland

VK4RIL Laidley repeater on 147.700 MHz  
VK4RRC Redcliffe 146.925 MHz IRLP node 6404,  
EchoLink node 44666

### In South Australia

VK5TRM, Loxton on 147.125 MHz  
VK5RSC, Mt Terrible on 439.825 MHz IRLP node 6278, EchoLink node 399996

came in handy to help explain to both him, and his father, what amateur radio is about. His dad is now going to contact Perth's amateur radio training group, Ham College to enquire about the foundation course.

Despite average propagation the day was a great success with members of the public seeing amateur radio in action and the HARG members having a fun day out. Many of Perth's already licensed hams called past at various times during the day so it was also a great opportunity for old friends to catch up. If the event becomes an annual one HARG will again be out and about engaging the public and promoting the hobby.

Thanks to Martin VK6ZMS for the report and picture.

The only JOTA report I have to hand is from the NCRG



*Sundown at the NCRG corral.*



*Soldering Practice at NCRG.*

who hosted the Herne Hill Scout & Guide group. One of the organisers from the scouts is a current NCRG member, Dean VK6DSL and the other main organiser was a former member, Greg VK6ED, who is returning to the hobby and the club. Both have children in the group and were keen to stage an all weekend event at NPSARC, Whiteman Park. They arrived early Saturday morning and set up tents and cooking facilities of their own and began all the planned events for the day. These included a soldering lesson with kits being built to make a flashing red led light unit, which proved interesting after dark that night. Several club members turned up to help with the HF side of things but conditions were not favourable on the Scout HF frequencies, along with competition from contest stations taking part in several other events over the same weekend. IRLP and Echolink were set up in Shack 2 and the meeting room and I was intrigued to see one young Guide glued to the microphone, chatting away like mad. I have to personally admit the evening BBQ on Saturday night was definitely worth being there for!

There were talks on radio and what was available before the internet, something these youngsters seem to find hard to grasp, no Twitter or Facebook! Everything was packed away by midday Sunday and the club premises and surrounding area were left cleaner than they had been for months.

This is the height of the contest season for NCRG members and things are in full swing with the addition of a new wide spaced five element Yagi from Tet Emtron in the Swan Valley up at 23 metres, something that has been missing for the 'money band' in most contests from WA. This will soon be followed with a wide spaced Yagi for 10 metres in the next few weeks.

I heard from Chris about VK6TNC-3 which is a new APRS Digipeater now installed in Wundowie to pick up stations coming into WA on the Great Eastern Highway. He can receive stations from just west of Northam to Sawyers Valley. Have a listen.

I also heard from John VK6ZN about activities up the west coast at Carnarvon. John comments 'Miles VK6CBA is active on HF and I have a scout leader studying for her foundation licence. I have had permission to put a VHF beacon at Carnarvon for the past 18 months, but finding a suitable donated beacon without too many rules attached has been difficult. The GARG will look at supplying a beacon in the near future as part of their interest in propagation along the west coast. 73, John VK6ZN'.

I have not received an entry for the shack photo section this month so please take a picture of your pride and joy and send it to me for the February edition. Any other input is always welcome. I will take this chance to wish all amateurs, SWLs and their families the very best wishes for the festive season, I hope you all have a happy and peaceful Xmas and a healthy and DX full new year. See you all in February!

73 Keith VK6RK

vk6rk@wia.org.au

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Icom .....	OBC
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TET-Emtron .....	15
Tower .....	63
TTS .....	13
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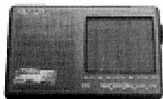
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# Erratum

## RF voltmeter for Transceiver Testing

*Jim Tregellas VK5JST*

An error in the component overlay for the "RF voltmeter for Transceiver Testing" article published in the November 2010 AR has been brought to my attention. Could you please urgently publish an Erratum as follows:

Erratum: Component Overlay and Wiring Diagram for RF Voltmeter AR November 2010 page 20 (Figure 2).

Please note that diodes D2 and D4 have been drawn incorrectly and should have their polarities reversed. These diodes appear on the left hand side of the left most CA3140 on the diagram.

Yours in embarrassment,

Jim Tregellas VK5JST.

Editor: We have updated the diagram with the correction included, and published this revised article on the AR web pages of the WIA website.



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